



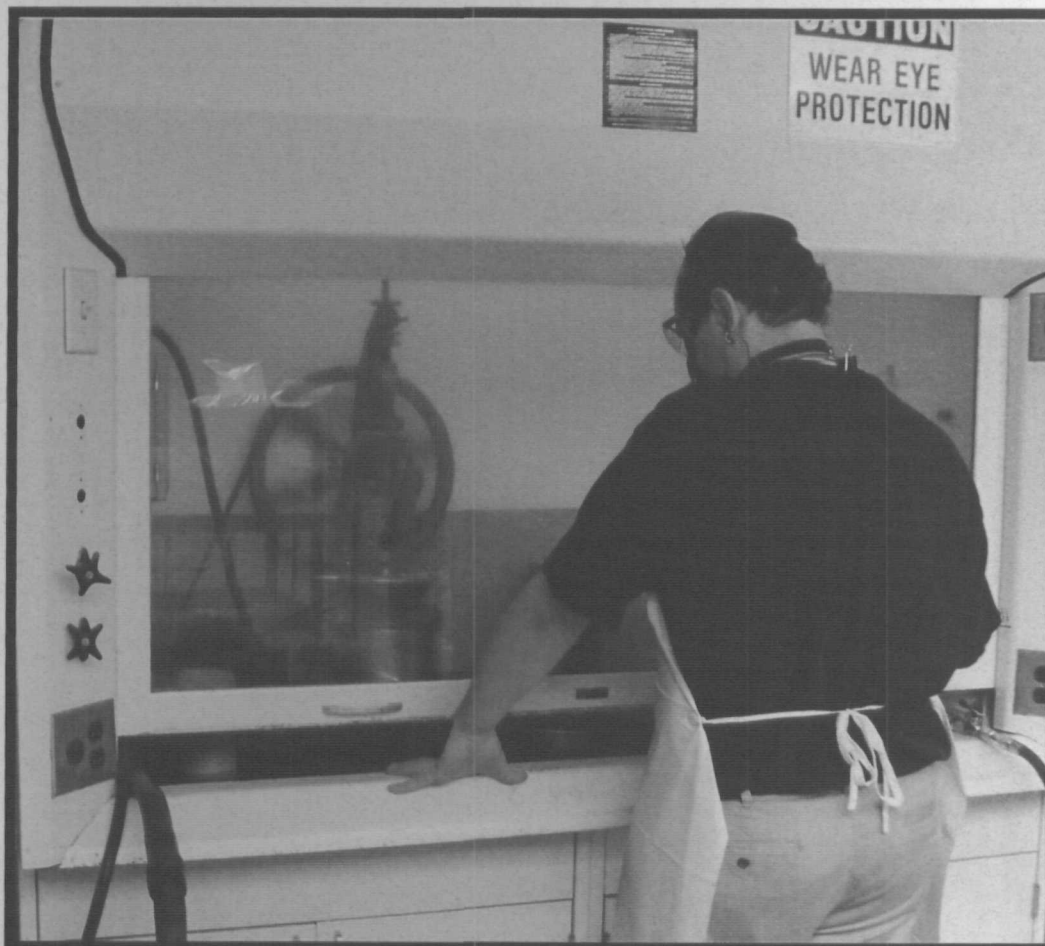
J. CHRISTIANSEN

**ADMINISTRATIVE
RECORD**

Libby Asbestos Site, Operable Unit 4 Libby, Montana

Close Support Facility Soil Preparation Plan

April 2003



Soil Preparation Plan

**Response Action Contract
for Remedial, Enforcement Oversight, and Non-Time
Critical Removal Activities at Sites of Release or
Threatened Release of Hazardous Substances
in EPA Region VIII**

U.S. EPA Contract No. 68-W5-0022

**Close Support Facility
Soil Preparation Plan
Libby Asbestos Site, Operable Unit 4**

April 25, 2003

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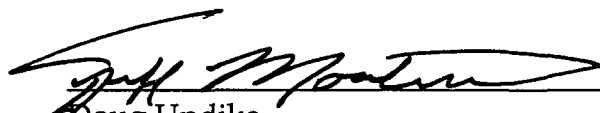
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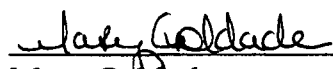
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Draft Sampling and Analysis Plan
Remedial Investigation
Libby Asbestos Site, Operable Unit 4

Work Assignment No.: 137-RIRI-08BC

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<i>Appendix B</i>	ISSI-LIBBY-01 Standard Operating Procedure (SOP)
<i>Appendix C</i>	CDM-LIBBY-06, CSF eLASTIC Module SOP
<i>Appendix D</i>	CDM SOP 2-1, Packaging and Shipping of Environmental Samples
<i>Appendix E</i>	CDM SOP 1-2, Sample Custody
<i>Appendix F</i>	CDM SOP 4-1, Field Logbook Content and Control
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Acronyms

CDM	CDM Federal Programs Corporation
COC	chain-of-custody
CSF	CDM close support facility
CSS	contaminant screening study
eLASTIC	electronic Libby amphibole sample tracking information center
EPA	U.S. Environmental Protection Agency
FSDS	field sample data sheet
g	gram
HSP	health and safety plan
ID	identification
IDW	investigation-derived waste
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
QA	quality assurance
QA/QC	quality assurance/quality control
QC	quality control
QAM	quality assurance manager
RAC	Response Action Contract
RI	remedial investigation
site	Libby Asbestos Site Operable Unit 4
SAP	sampling and analysis plan
SOP	standard operating procedure
SPP	soil preparation plan
µm	micron
Volpe Center	U.S. Department of Transportation John A. Volpe Center

Section 1

Introduction

This document serves as the soil preparation plan (SPP) for the Libby Asbestos Site Operable Unit 4 (site). This SPP details requirements and procedures specific to the soil preparation activities that occur at the CDM Federal Programs Corporation (CDM) close support facility (CSF). The purpose of this SPP is twofold. First, it is to provide guidance to ensure that all preparation procedures and measurements are scientifically sound and of known, acceptable, and documented quality. Second, this SPP outlines a laboratory monitoring program consisting of ambient air samples, personal air samples, and dust samples that will be implemented to determine potential exposure and cross-contamination. All requirements and activities described in the contaminant screening study (CSS) sampling and analysis plan (SAP) (CDM 2002) still apply.

The following sections and appendices are included in this SPP:

Soil Preparation Plan

Section 1 - Introduction

Section 2 - CDM Support Facility Program Activity Methods and Procedures

Section 3 - Quality Assurance/Quality Control

Section 4 - References

Appendix A - Quality Assurance Manager Checklist

Appendix B - Soil Sample Preparation - SOP No.: ISSI-LIBBY-01

Appendix C - CSF eLASTIC Module - SOP No.: CDM-LIBBY-06

Appendix D - Packaging and Shipping of Environmental Samples - SOP No.:
CDM 2-1

Appendix E - Sample Custody - SOP No.: CDM SOP 1-2

Appendix F - Field Logbook Content and Control - SOP No.: CDM SOP 4-1

Appendix G - Field Sample Data Sheet

Appendix H - CSF Chain-of-Custody Form

Appendix I - Record of Deviation/Request for Modification Form

Appendix J - Health and Safety Plan

1.1 Objective

The objective of the CSF activities is to prepare soil samples collected at the Libby site prior to analysis. The preparation includes drying, sieving, splitting, and grinding. The preparation procedures are designed to produce a sample with well-homogenized material of a standard particle size for asbestos analysis.

1.2 Project Schedule and Deliverables

This work assignment was initiated in 2002. The preparation activities began in July 2002, and it is unknown at this time how long the preparation activities will last.

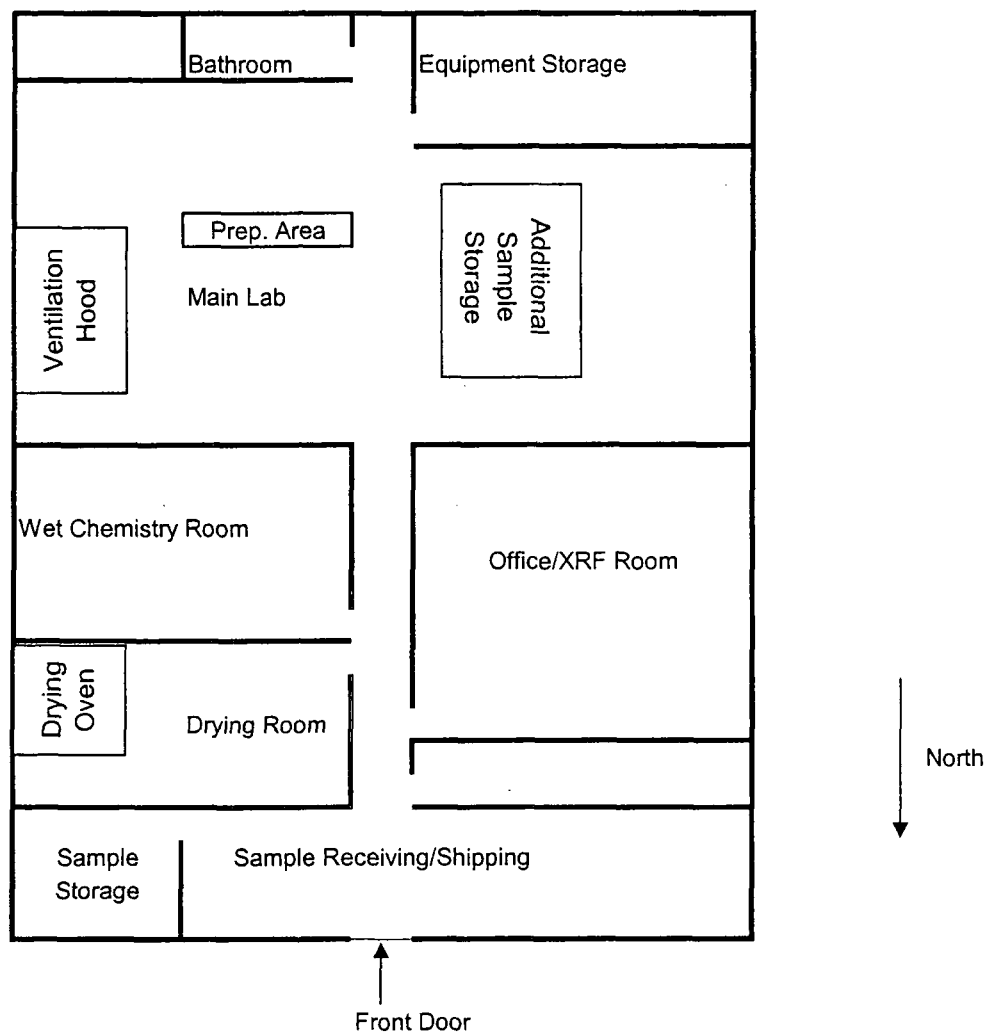
Deliverables to the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Transportation John A. Volpe Center (Volpe Center) include biweekly quality assurance (QA) reports. Internally, weekly progress reports will be prepared by CSF staff and sent to the CDM project manager. These weekly progress reports will include the number of samples that have been completed each step of the preparation process (i.e., receiving, drying, splitting, sieving, grinding, and shipping) during the time frame of the review period along with comments regarding any unusual occurrences, quality issues, and corrective actions taken. These weekly progress reports will be included as attachments to the biweekly QA reports. The QA reports will be prepared by CDM's quality assurance manager (QAM) assigned to Libby and sent to the CDM project manager, EPA regional chemist, and the Volpe Center. The biweekly QA report is a completed checklist as provided in Appendix A, along with any notes or documentation that are required for understanding the checklist. These checklist reviews will be completed by the QAM assigned to Libby or their delegate and issued by the following Friday after the checklist period being reviewed. These QA reports will then be sent to associated project personnel (e.g., project manager, project task leader, etc.), the EPA RPM and project chemist, and the project files.

If any deficiencies are noted during a checklist review, the project manager and/or CSF sample coordinator will be notified by the QAM and corrective action will then be determined by the project manager, QA staff member, and/or the QAM. If the corrective action can be immediately implemented, then the deficiency will be immediately corrected. If the corrective action cannot or is not immediately implemented, then an improvement plan will be issued. If the actions included in the improvement plan are not completed by the due date on the plan, the project manager, QAM, and CSF sample coordinator will try to resolve the issue. If the deficiency cannot be resolved within a week after the improvement plan due date, a corrective action request form will be issued.

1.3 CDM Close Support Facility Location and Description

The CDM CSF is located at 2714 Walnut Street, Denver CO, 80502. The CSF consists of approximately 3000 square feet of space. The CSF has an office/X-ray fluorescence room, a soil drying room, wet chemistry room, storage/receiving room, equipment storage room, and the main laboratory that contains the fume hood, sinks, benches and laboratory equipment. Both the drying oven and the fume hood are vented to a HEPA filter unit designed to remove particles less than 1 micron (μm). Figure 1-1 provides a layout of the CSF.

Figure 1-1 CSF Layout



Section 2

Methods and Procedures

The following is a list of activities that will be performed by CDM personnel at the CSF:

- Sample receipt and check-in
- Sample storage
- Sample drying
- Archive sample splitting
- Sample sieving
- Fine sample grinding
- Fine sample splitting and archiving
- Sample packaging and shipping
- CSF measurements
- Documentation
- Equipment decontamination
- Investigation-derived waste containment/disposal

All sample preparation procedures will follow the Technical Standard Operating Procedure (SOP) ISSI-LIBBY-01, Soil Sample Preparation provided in Appendix B. The following subsections may also reference other EPA and/or CDM SOPs. The procedures followed at the CSF are shown in Figure 2-1.

2.1 Sample Receipt and Check-in

CDM will receive soil samples from the site via common carrier (e.g., Federal Express). Upon receipt, the samples will be checked in to verify the sample identification labels match the chain-of-custody (COC) forms contained in the shipping coolers. If there are any discrepancies between the two, the Libby sample coordinator will be notified, and the discrepancy will be corrected. The sample index identification (ID) numbers of all of the samples (parent and quality control [QC]) are entered into the electronic Libby asbestos sample tracking information center (eLASTIC) as detailed in SOP CDM-LIBBY-06 (Appendix C). After check-in and entry, a sample preparation form will be printed for the batch(es) that was/were checked in.

2.2 Sample Storage

All samples will be contained as directed in the ISSI-LIBBY-01 SOP (Appendix B). Whenever the samples are not being processed, they will either be stored in the coolers in which they were received or in cardboard boxes per batch labeled with batch number and identification codes of the samples contained in the box. These

boxes will be arranged in numerical order by batch number for easy retrieval. Boxes will be stored either in the sample storage room or in the main laboratory (Figure 1-1). The samples do not require refrigeration but must be kept in an orderly, clean fashion.

2.3 Sample Drying, Splitting, Sieving, and Grinding

All samples will be dried, split, sieved, and ground in accordance with SOP ISSI-LIBBY-01 (Appendix B). The following is a chronological summary of the general protocol for these activities. First, the sample will be dried in the oven for approximately 48 hours or until dry, then the sample will be split and approximately half will be archived. After the archive splitting, the sample will again be split in half if a duplicate is required, and the duplicate aliquot will follow the same procedures as the original portion. If no duplicate is required, the total sample will be sieved, and the coarse fraction will be contained for analysis (with a suffix label of "C" for coarse). The finer fraction will then be ground and split into four sub-samples (with a suffix of either "FG1," "FG2," "FG3," and "FG4"). Three of the subsamples will be archived. When the first analysis is required for the fine fraction of the sample, the subsample labeled "FG1" will be sent for analysis. If further analyses are required for the fine ground portion, the subsequent aliquot will be sent (i.e., FG2, then FG3, etc.).

2.4 Sample Packaging and Shipping

All samples will be packaged and shipped in accordance with CDM SOP 2-1, Packaging and Shipping of Environmental Samples with modifications (Appendix D). Custody will also be tracked by following CDM SOP 1-2, Sample Custody (Appendix E) with COC forms being created in eLASTIC in accordance with CDM-LIBBY-06 (Appendix C).

Electronic copies of COC forms will be sent to the Volpe Center for upload into the Libby database. Details regarding the frequency and format of this transfer are still being developed. The details, when resolved, will be described under separate cover.

2.5 CSF Measurements

The only measurement data collected by the CSF personnel related to soil samples are oven temperatures and sample masses. The oven temperatures and the sample masses will be collected and recorded on the sample preparation form as indicated in the ISSI-LIBBY-01 SOP (Appendix B). All calibration and maintenance requirements are detailed in Section 3 and Attachment 1 of the Health and Safety Plan (HASP) included in Appendix J of this SPP. Measurement requirements related to laboratory environmental and health and safety exposure monitoring are included in Appendix J (see HASP and Attachment 1).

2.6 Documentation

All activities will be documented as required in SOPs 4-1, Field Logbook Content and Control (Appendix F), ISSI-LIBBY-01 (Appendix B) and CDM-LIBBY-06 (Appendix C). Any modifications to these SOPs must be approved in writing by the CDM

project manager (or delegate) and the EPA project chemist (or delegate) prior to implementation. Quality assurance/quality control (QA/QC) documentation is described in Section 3.

2.7 Equipment Decontamination

All equipment will be decontaminated prior to use in accordance with SOP ISSI-LIBBY-01 (Appendix B). This decontamination will be conducted after and/or before each sample is in contact with any piece of equipment.

2.8 Investigation-Derived Waste Containment

Investigation-derived waste (IDW) consists of personal protective equipment (PPE), (i.e., tyvek), HEPA filters (i.e., hood and vacuum), and decontamination waste (i.e., excess sample and silica sand vacuumed from the hood and around the CSF during decontamination). The PPE and filters will be collected after each use and stored in plastic bags (e.g., trash bags) until disposal. The decontamination waste will be stored in a designated trash can. All IDW will be double-contained and disposed of as municipal waste.

Section 3

Quality Assurance/Quality Control

This section details the internal QA/QC samples, equipment calibration, QA/QC checks, audits/corrective actions, and training requirements for the CSF.

3.1 QA/QC Samples

Three types of QA/QC samples will be collected during the preparation process: preparation duplicates, preparation blank samples, and grinding blank samples.

3.1.1 Preparation Duplicate Samples

Preparation duplicate samples are splits of samples submitted for sample preparation after drying but prior to sieving. These samples serve to evaluate the precision of both the sample preparation process and the laboratory analysis. One preparation duplicate sample will be processed for every 20 field samples prepared. The preparation duplicate samples are given sample identification numbers provided to the CSF by sample coordination personnel in Libby, Montana.

In order to ensure the preparation duplicate FSDS's are completed and consistent with its parent sample, the FSDS's will be created automatically via the Libby Project Database (Libby2) by Volpe. Consequently, the CSF will be required to electronically send Volpe information regarding the preparation duplicate and parent IDs on a weekly basis. Following creation of the preparation duplicate FSDS's, copies will be printed and sent to the Libby sample coordinator. Details regarding the procedures and format of this transfer are still being developed. The details, when resolved, will be described under separate cover.

3.1.2 Preparation Blank Samples

Preparation blank samples are prepared to determine if cross-contamination is occurring during sample drying. The preparation blank consists of clean quartz sand. One preparation blank will be processed with each batch of field samples. A batch of samples is a group of samples that have been prepared together for analysis at the same time (approximately 125). The preparation blank samples are given sample identification numbers provided to the CSF by sample coordination personnel in Libby, Montana. For each preparation blank prepared, an FSDS (Appendix G) is completed as detailed in the CSS SAP, and a copy is sent to the sample coordinator who will then forward them onto Volpe.

3.1.3 Grinding Blank Samples

Grinding blank samples are prepared to determine if decontamination procedures of laboratory equipment used to prepare asbestos samples are adequate to prevent cross-contamination of samples during sample grinding and splitting. The grinding blank will consist of clean quartz sand and will be processed once per day, on days that field samples are ground. The grinding blank samples are given sample identification numbers provided to the CSF by sample coordination personnel in

Libby, Montana. For each grinding blank prepared, an FSDS (Appendix G) is completed as detailed in the CSS SAP, and a copy is sent to the sample coordinator and Volpe.

3.2 Equipment Calibration and Maintenance

Table 3.1 summarizes the calibration procedures, frequency, and location of documentation of each piece of equipment used in the preparation process. In addition, detailed descriptions of each of these calibration procedures is provided below.

Table 3.1 Equipment Calibration and Maintenance Summary Table

Calibration	Frequency	Where Documented
Grinder	minimum: once per day; or every time plate depth is adjusted	Grinder calibration and maintenance log
Drying Oven	once per week	Oven temperature calibration and maintenance log
Ventilation Hood HEPA Filter Velocity	daily daily	Ventilation hood log Ventilation hood log
HEPA Vacuum	as needed	Vacuum maintenance log
Analytical Balance	daily	Balance maintenance log

3.2.1 Grinder Calibration

The vertical plate grinder will be calibrated every day it is used and every time the disk depth is adjusted to verify target particle size. Approximately 50 to 100 grams (g) of clean quartz sand are processed through the grinder. The ground sand is then passed through a 60-mesh and a 200-mesh sieve. Calibration is successful when all of the ground sand passes through the 60-mesh sieve and some portion of the ground sand is retained on the 200-mesh sieve. Grinder calibration is documented in the CSF logbook and on the grinder calibration and maintenance log (SOP ISSI-LIBBY-01, Appendix B).

3.2.2 Drying Oven Calibration Check

The drying oven calibration is checked once per week by setting the temperature control to 90°C and letting the oven preheat to the set temperature. A thermometer is placed in the oven and the temperature is recorded. The acceptable criteria is $\pm 1^{\circ}\text{C}$. If the calibration fails, repairs are made to the oven until recalibration of the oven is in agreement with acceptable criteria. All oven calibration will be documented in the CSF logbook and on the oven temperature calibration and maintenance log (SOP ISSI-LIBBY-01, Appendix B).

3.2.3 Ventilation Hood Operating Condition Verification

Two calibration checks will be conducted on the ventilation hood. One will be a check of the hood's HEPA filter, and the second will be a check of the negative flow velocity.

The ventilation hood HEPA filter has an indicator light located on the front panel that identifies whether the filter needs to be changed. This panel will be checked daily to ensure that the HEPA filter is operating correctly. If the filter change light is on, the filter will be changed before any operations proceed in the hood. All ventilation hood operating condition verification checks and maintenance will be documented in the CSF logbook and the ventilation hood operating condition verification and maintenance log (SOP ISSI-LIBBY-01, Appendix B).

The velocity of the negative flow HEPA hood will be checked with a flow meter/anemometer daily. The minimum allowable velocity in the negative flow HEPA hood will be 100 feet per minute. A line will be drawn on the hood sash frame indicating the sash location where the minimum velocity is observed. The sash will not be opened further than this point, and during grinding operations, the sash will be lowered to increase the flow velocity.

3.2.4 HEPA Vacuum Filter Check

The HEPA vacuum used to decontaminate the grinder, splitter, sieves, pans, and other decontamination areas will be checked daily for correct operations. Replacement of either the bag or filter will be performed in the hood. All vacuum checks and maintenance will be documented in the CSF logbook and the vacuum maintenance log (SOP-ISSI-LIBBY-01, Appendix B).

3.2.5 Analytical Balance Calibration Check

The calibration of the balance used to weigh samples will be checked daily. Class-S weights will be used to verify the internal calibration at 0.1g, 1g, 10g, and 100g. Tolerance limits for the calibration check are ± 0.1 g. If the balance fails the calibration check, the balance will be re-calibrated. All analytical balance calibration checks and maintenance will be documented in the CSF logbook and the analytical balance calibration and maintenance log (SOP ISSI-LIBBY-01, Appendix B).

3.3 Laboratory Housekeeping

The following housekeeping measures will be put in place to help ensure a safe and clean working environment. These measures are discussed further within Attachment 1 of the CSF HASP (see Appendix J).

- The walls and counter top of the negative flow HEPA hood will be wet wiped and HEPA vacuumed after the completion of each day.
- Sticky mats will be placed in the doorways of the drying room and the main laboratory to reduce the potential to track materials throughout the laboratory.
- Areas of sample handling and preparation, including floors, will be HEPA vacuumed and wet wiped at the end of each day.
- The sample drying oven will be HEPA vacuumed and wet wiped after each batch of samples.

3.4 QA/QC Checks

A series of QA/QC checks will be used to ensure data are accurate and recorded according to the procedures of this SPP, the soil sample preparation SOP, and CSF eLASTIC SOP.

3.4.1 Sample Receipt and Check-In

One day a week, COC forms received on that day will be reviewed and verified against the shipment contents by a second person to ensure that the information on the COC form matches the cooler contents. The reviewer will initial and date the COC forms after review. This check will ensure sample check-in procedures are being implemented correctly. If there are any discrepancies not found by the original sample receiver, he/she, will be notified and retrained so that future discrepancies will be identified by him/her. The discrepancy will also be corrected after contact with the sample coordinator. COC discrepancies and their corrections must also be provided to Volpe, in order to ensure COC data maintained within the project database (Libby2) is accurate and complete.

3.4.2 Sample Drying and Sieving

Daily, a second person, other than the sample preparer, must check the batch sample preparation form to ensure all entries are complete and correct. The reviewer will initial and date the sample preparation forms after review. If any entries are not complete or correct, the person originally filling out the form will correct the form and then be retrained so that future mistakes are not made.

3.4.3 Sample Packaging and Shipping

For every sample shipment from the CSF, a second person will check the prepared COC form against the shipment contents to ensure all samples in the shipment appear on the COC form (and visa versa), all sample labels (both inside and outside bags) are correct, and there are no duplicate or missing labels. The reviewer will initial and date the COC forms after review. If there are any discrepancies, the COC will be corrected and the person who originally packaged the cooler for shipment will be retrained so as to avoid future mistakes.

3.4.4 CSF Measurements Calibration and Maintenance

A second person, other than the person that performed the equipment calibration and/or maintenance, must check the calibration and/or maintenance log sheets at some point during the daily operations to ensure the logs and calibration procedures were completed. The reviewer will initial and date the log sheets after review. If it is noted that the logsheets or calibration procedures have not been completed, logsheets will be corrected and the person who originally conducted the calibration will be retrained so that the logsheets and calibration procedures will be completed and correct in the future.

3.4.5 Documentation

This section describes the QA/QC of CSF documentation and procedures for making corrections to CSF documentation.

3.4.5.1 Logbooks

Details regarding each sample preparation step will be recorded in the laboratory logbook in accordance with CDM SOP 4-1, Field Logbook Content and Control (Appendix F). The log is an account of daily activities and will duly note problems or deviations from the governing plans and observations relating to the soil preparation activities. Information that is already recorded in log sheets (i.e., grinder calibration log, ventilation hood log, etc.) does not need to be duplicated in the log book. Upon issuance of a logbook, the logbook will be given a document control number. Prior to completion of a logbook, the logbook pages will be copied weekly and placed in the project files in the CDM office files. Upon completion of the logbook, it will be placed in the CDM Denver project files. Details about what information should be recorded in the logbook are included in the aforementioned SOP. A person other than the one who completed the entries will check logbook entries on a weekly basis. The logbook checks will ensure all relevant information has been recorded. If any logbook entries are incorrect or incomplete, the logbooks will be corrected and the person originally entering the information into the logbook will be retrained so that future logbook entries are complete and correct.

3.4.5.2 Chain-of-Custody Requirements

COC procedures will follow the requirements stated in CDM's SOP 1-2, Sample Custody (Appendix E) and CDM-LIBBY-06 (Appendix C). The COC record is used as physical evidence of sample custody and control. This record system provides the means to identify, track, and monitor each individual sample from the point of collection through final data reporting. A complete COC record is required to accompany each shipment of samples. Upon receipt and prior to the shipment of samples, the COC should be checked against the contents of the cooler as detailed above. An example of the COC used at the CSF is provided in Appendix H.

3.4.5.3 Electronic Libby Asbestos Sample Tracking Information Center (eLASTIC)

The eLASTIC database will be used to track various pieces of information during the sample preparation process. CSF personnel other than the person who completed the data entry will check 100 percent of the data entered into eLASTIC on a weekly basis. The data entry check will be documented in the logbook. Details regarding the information tracked in eLASTIC can be found in appendix C.

3.4.5.4 Forms

FSDS, preparation log sheets, and calibration and maintenance logs must be completed in accordance with technical SOP ISSI-LIBBY-01, Soil Sample Preparation (Appendix B). When these sheets have been completed, CSF personnel, other than the person who completed the sheet, will check to ensure the data are accurate and complete as detailed above.

3.4.5.5 Sample Labeling

As described in the SOP ISSI-LIBBY-01 (Appendix B), suffixes are added to sample identification numbers to indicate bulk fraction, coarse fraction, fine fraction, fine, ground fraction, and the archived portion of each of these fractions. Table 3.2 presents the suffix identification codes and descriptions.

Table 3.2 Suffix Identification Codes and Description

Code	Description
C	Coarse - sample fraction that does not pass through a 1/4-inch sieve
B*	Bulk - sample fraction that passes through a 3/8-inch sieve, but is not ground
F	Fine - sample fraction that passes through a 1/4-inch sieve
FG	Fine Ground - sample fraction that passes through a 1/4-inch sieve and is ground to approximately 250 um
A	Archive - the archived portion of the dried field sample

Code	Description
CA	Archive Coarse - the archived portion of the coarse fraction
BA*	Archive Bulk - the archived portion of the bulk fraction
FA	Archive Fine - the archived portion of the fine fraction
FGA	Archive Fine Ground - the archived portion of the fine ground fraction

* Used for samples prepared under SOP No. ISSI-LIBBY-01 (Revision 0)

In addition to labeling individual samples, storage boxes are also labeled as described in CDM-LIBBY-06 (Appendix C).

3.4.5.6 Correction to and Deviations from Documentation

Logbook modification requirements are described in CDM's SOP 4-1, Field Logbook Content and Control (Appendix F). For the logbooks, a single strikeout initial and date is required for documentation changes. The correct information should be entered in close proximity to the erroneous entry. These procedures will also be followed for corrections to any form (FSDS, log sheets, and COC). All deviations from the guidance documents will be recorded in the logbooks and the Libby Request for Modification Form (MOD)(Appendix I). All MOD forms are to be completed, approved, and recorded following the approval process flowchart included within Appendix I. Any major deviations will be documented according to the quality management plan (CDM 2003).

3.4.6 QA/QC Check Corrective Actions

Immediate actions will be taken to correct any findings during the daily QA/QC checks, if applicable. If immediate action is not applicable, an implementation plan must be completed and approved by the project manager and RAC VIII QA manager. If corrective action is immediate, the action will be documented in the CSF logbook, and the project manager and RAC VIII QA manager (or designate) will be notified of the corrective action within 3 days.

3.5 Audits and Corrective Actions

An internal audit will be performed during the initial implementation of this SPP. If findings of this audit show the procedures of this SPP are not being implemented (i.e., many deficiencies are identified), an additional audit may be conducted within 1 to 2 weeks of the initial audit. An additional audit will be performed when samples are being prepared on a large scale (i.e., during full-time operation of the CSF for preparation and full-time analysis). If significant procedural changes occur during the study, additional audits may be conducted to ensure the new methods are implemented and followed appropriately. Audit reports will be completed following each audit. This report is a CDM internal document and will be maintained in the RAC VIII project files in the CDM Denver office; a copy of the audit report, as well as any corrective action reports, will be provided to EPA, upon request.

Response actions may be implemented to correct quality problems as detailed above. All corrective actions will be documented in accordance with this SPP and the CSS SAP.

3.6 Training Requirements

Personnel performing sample preparation activities must have read and understood this SPP, the facilities health and safety plan, and all associated SOPs. In addition, personnel must have completed 40-hour Occupational Safety and Health Administration (OSHA) hazardous waste operations training and annual updates, as required.

Section 4

References

CDM. 2002. Libby Asbestos Site, Operable Unit 4, Libby, Montana. Final Sampling and Analysis Plan, Remedial Investigation, Contaminant Screening Study.

CDM. 2003. RAC Region VIII Quality Management Plan. January

Appendix A

Quality Assurance Manager Checklist

Memorandum

To: Tim Wall, Project Manager

From: Quality Assurance Manager

Date:

Subject: Libby CSS QAM Checklist for _____ to _____

The following summarizes the soil preparation activities that are being verified biweekly by the QAM for Libby. These activities are discussed in the soil preparation plan.

Sample Receipt and Check-In

(QAM will attach the associated COCs)

Number of samples received during the checklist period _____
Total number of samples received _____
Number of weeks at least one sample was received during the checklist period _____
Number of days the COC forms were checked during checklist period _____
Number of COC forms checked during checklist period _____
Total number of COC forms checked _____
Record any COC discrepancies noted during the checklist period and corrective action taken _____

Sample Drying

(QAM will include copies of Sample Preparation Log Sheets for time period checked)

Number of samples dried during the checklist period _____
Total number of samples dried _____

Sample Splitting

Number of samples split for archives during the checklist period _____
Total number of samples split for archive _____

Sample Sieving

Number of samples sieved during the checklist period _____
Total number of samples sieved _____

Sample Grinding

Number of days samples were ground during the checklist period _____
Number of particle size verifications noted on the grinder calibration
and maintenance log during the checklist period _____
Number of samples ground during checklist period _____
Total number of samples ground _____

Sample Packaging and Shipping

Number of samples shipped during checklist period _____
Total number of samples shipped _____
Number of COC forms completed for shipping samples during the checklist period _____
Number of COC forms checked during the checklist period _____

Other Documentation

Number of days recorded on the grinder calibration and maintenance log during checklist period _____
Number of weeks oven was used during checklist period _____
Number of days recorded on the oven temperature calibration and maint. log during checklist period _____
Number of days balance was used during checklist period _____
Number of days recorded on the Analytical Balance Calibration and Maint. Log during checklist period _____
Number of days ventilation hood was used during checklist period _____
Number of days recorded on the Ventilation Hood Operating Condition Verification and Maint. Log _____
Number of days vacuum used during checklist period _____
Number of days recorded on the Vacuum Maint. Log during checklist period _____
Number of days all calibration and/or maintenance sheets were checked _____

If any of the calibration and/or maintenance sheets were not checked on any day during the checklist period, note why

Quality Control Samples**Preparation Duplicates (1/20)**

Number of samples prepared (excluding QA/QC samples) during checklist period _____
Number of preparation duplicates collected during checklist period _____
Ratio _____
Total number of samples prepared (excluding QA/QC samples) _____
Total number of preparation duplicates collected _____
Ratio _____

Preparation Blanks (1/batch [oven])

Number of batches prepared during checklist period _____
Number of preparation blanks collected _____
Ratio _____
Total number of batches prepared _____
Total number of preparation blanks collected _____
Ratio _____

Data Entry Checks (100% of data entry)

Number of weeks data was entered into the eLASTIC during checklist period _____
Number of times 100% of data was checked during checklist period _____
Name of person(s) checking data entries _____

Modifications to the Preparation Plan

Modification forms completed:

Was technical review conducted? _____

Was QA review conducted? _____

Overall comments:

Environmental and Personal Monitoring

Number of ambient air samples taken _____
Number of personal air samples taken _____
Number of microvac samples taken _____
Was dust monitoring conducted? _____
If yes, what type? _____

cc: Mary Goldade, EPA
Mark Raney, VOLPE
George DeLullo, CDM
Jeff Montera, CDM
Dee Warren, CDM

Appendix B

ISSI-LIBBY-01 Soil Sample Preparation

Date: March 24, 2003

SOP No. ISSI-LIBBY-01 (Rev. 6)

Title: SOIL SAMPLE PREPARATION

Author: William Brattin

Syracuse Research Corporation(a)

SYNOPSIS: A standardized method for preparation of soil samples for asbestos analysis is described.

Received by QA Unit:

APPROVALS:

TEAM MEMBER

SIGNATURE/TITLE

DATE

EPA Region 8

Mary Goldade

4/28/03

Syracuse Research Corp.

W. Brattin

4/28/03

Revision Number	Revision Date	Reason for Revision
1	1/7/00	Incorporation of sieving to the sample preparation.
2	7/12/00	Revision in sieve size, other minor edits.
3	5/7/02	Incorporate minor edits
4	8/1/02	Modify sieving procedure, add grinding step
5	3/6/03	Incorporate modifications to the procedure and documentation requirements
6	3/24/03	Incorporate modifications to the logsheets to conform with electronic data storage requirements and add grinder blank requirements.

(a) This SOP was originally prepared by ISSI Consulting Group. ISSI is no longer in existence, and finalization of the SOP was performed by Syracuse Research Corporation (SRC).

TECHNICAL STANDARD OPERATING PROCEDURE

ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide a standardized method for preparation of soil samples for analysis for asbestos. This procedure will be used by employees of USEPA Region 8 and by contractors/subcontractors supporting USEPA Region 8 projects and tasks for the Remedial Investigation work performed at the Libby, Montana site. Site-specific deviations from the procedures outlined in this document must be approved by the USEPA Region 8 Remedial Project Manager or Regional Chemist prior to initiation of the sampling activity.

2.0 RESPONSIBILITIES

The Preparation Laboratory Project Leader (PL²) may be an USEPA employee or contractor who is responsible for overseeing the soil sample preparation activities. The PL² is also responsible for checking all work performed and verifying that the work satisfies the specific tasks outlined by this SOP and the Project Plan. It is the responsibility of the PL² to communicate with the Preparation Laboratory Personnel regarding specific collection objectives and anticipated situations that require any deviation from the Project Plan. It is also the responsibility of the PL² to communicate the need for any deviations from the Project Plan with the appropriate USEPA Region 8 Remedial Project Manager or Regional Chemist.

Personnel preparing surface soil samples are responsible for adhering to the applicable tasks outlined in this procedure and, with the exception of weighing tasks, conducting all sample handling and preparation activities in the ventilation hood.

3.0 EQUIPMENT

- General purpose laboratory oven - must be capable of maintaining a constant temperature of approximately 89-91°C.
- Analytical balance - calibrated and accurate to 0.1 g, range of 0.1 g to 1000 g
- Riffle splitter - with ½ inch chutes to split samples
- Plate Grinder - capable of accepting soil particles of approximately 1/4 inch diameter and grinding to produce particle of approximately 250 µm
- Metal (other than plastic) scoop or spoon - for transferring samples

TECHNICAL STANDARD OPERATING PROCEDURE

ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

- 1/4 inch metal (other than plastic) sieve and catch pan - for coarse sieving samples
- 60 mesh (250 μm) and 200 mesh (74 μm) metal (other than plastic) sieves - for verification of the plate grinder settings
- Sample containers - plastic ziplock bags
- Gloves - for personal protection and to prevent cross-contamination of samples. May be plastic or latex. Disposable, powderless
- Field clothing and Personal Protective Equipment - as specified in the Health and Safety Plan
- Field notebook - used to record progress, any problems or observations
- Three-ring binder books - binders will contain:
 - Sample Preparation Log Sheets (Attachment 1)
 - Analytical Balance Calibration and Maintenance Log (Attachment 2)
 - Grinder Calibration and Maintenance Log (Attachment 3)
 - Ventilation Hood Calibration and Maintenance Log (Attachment 4)
 - Vacuum Maintenance Log (Attachment 5)
 - Oven Temperature Calibration and Maintenance Log (Attachment 6)
 - Sample labels
- Trash Bags - used to dispose of gloves and wipes
- Indelible Marking Pen - used to record sample information onto plastic ziplock bags.
- Indelible Ballpoint Pen - used to record field logsheets and logbooks.

4.0 METHOD SUMMARY

Figure 1 provides an overview of the steps in this procedure. Soil samples are dried in a standard laboratory oven and split into a preparation sample and an archive sample. The preparation sample is sieved to separate coarse material ($> 1/4$ inch) from fine material ($< 1/4$ inch). The fine material is ground to a standard particle size of about 250 μm for subsequent analysis for asbestos. The coarse material is examined by stereomicroscopy to determine if any large particles of asbestos are present (EPA SOP SRC-LIBBY-01).

TECHNICAL STANDARD OPERATING PROCEDURE

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5.0 BULK SOIL DRYING

Prior to drying each sample, record the sample weight to the nearest 0.1 g on the Sample Preparation Log Sheet (Attachment 1).

Set the oven temperature to 89-91°C. Oven temperature calibration will be performed daily. Document oven temperature calibration and any required maintenance on the Oven Temperature Calibration and Maintenance Log (Attachment 6).

For every sample preparation batch, check the oven temperature to verify that proper temperature has been reached and document the start date/time and temperature on the Sample Preparation Log Sheet (Attachment 1). Place one or more samples in the oven, each sample contained in its plastic sample bag. Ensure each bag is upright to avoid spillage and open at the top to allow moisture to escape. Leave the samples in the oven overnight or until completely dry. Verify that each sample is dry by testing cohesiveness using a freshly gloved thumb and forefinger. Record the date/time and the oven temperature at completion of drying on the Sample Preparation Log Sheet (Attachment 1). Turn off the oven and allow the samples to cool in the oven. Record the weight after drying to the nearest 0.1 g as well as the sample drying time for the preparation batch on the Sample Preparation Log Sheet (Attachment 1).

6.0 DIVISION OF ARCHIVE AND PREPARATION SAMPLES

Before placing samples in the hood verify that the hood is turned on and the ventilation system is operating properly (Attachment 4).

Place the cooled samples in the hood, completely seal each bag, and then knead the contents of the bag to break up any soil clumps. Divide the sample into two parts using a splitter. Splitting must be performed in the hood to prevent exposure to any fibers that might be released from the sample into air.

After splitting, one part is used for sample preparation, as described below. The other part is stored as an archive sample in the event additional analyses are required in the future. Identify the archive sample with the same sample label as the original sample along with the suffix "A" (for archive fraction).

Decontaminate the splitter between all samples using compressed air. Brush or wipe off any visible material that is not removed by the air blast.

TECHNICAL STANDARD OPERATING PROCEDURE

ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

7.0 PREPARATION SAMPLE SIEVING

Before handling samples verify that the hood is turned on and the ventilation system is operating properly (Attachment 4).

Sieve each sample using a 1/4 inch stainless steel screen. Pour the material which does not pass through the screen into a new sample bag and mark the outside of the bag with the Index ID, along with the suffix "C" (for "coarse fraction"). Record the weight of the coarse fraction to the nearest 0.1 g in the Sample Preparation Log Sheet (Attachment 1). If all of the material passes the screen (such that there is no coarse fraction), record a weight of zero for the coarse fraction on the Sample Preparation Log Sheet (Attachment 1). Whenever possible, immediately process the fine material that passes through the screen in accord with the approach described in Section 8.2 (below). If processing cannot occur immediately, pour the fine material which passed through the sieve into a new plastic sample bag and mark the outside of the bag with the Index ID, along with the suffix "F" (for "fine fraction").

8.0 FINE SAMPLE GRINDING

Before handling samples in the hood verify that the hood is turned on and the ventilation system is operating properly (Attachment 4).

8.1 Grinder Set-Up

Grinding of the dried and sieved fine soil fraction is achieved using a standard BICO vertical plate grinder. Prior to sample grinding, the plates of the vertical grinder are adjusted to produce a material with a particle size of about 250 μm . Verification of proper particle size as well as demonstrating samples will not be over-processed is shown by initially processing a sample of quartz sand and subsequently sieving the processed quartz using stacked sieves. The grinder is considered to be adjusted acceptably if all material passes through a 60-mesh (250 μm) screen and substantially retained by a 200-mesh (74 μm) sieve. This verification of particle size should be checked once daily and after any adjustments to the plates are made. Verification of acceptable adjustment is documented in a grinder calibration and maintenance log (Attachment 3).

8.2 Grinding of Fine Field Samples

Load the hopper and allow all of the fine sample (that which has passed through the 1/4 inch screen) to pass through the plate grinder. Collect all of the sample as it emerges from the plate grinder in the catch pan. Transfer the ground material into a new, tared ziplock plastic bag.

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Mark the outside of the bag with the Index ID and the suffix "FG" (for "fine fraction, ground"). Completely seal the bag. Similar feed times for individual samples through the grinder should be promoted by maintaining consistency in the loading and grinding process.

8.3 Cleaning the Grinder

Movement of the plates is not required to clean the apparatus. The hopper and catch pan are cleaned using a vacuum followed by a blast of high pressure air. The catch pan is then set aside and the grinder is cleaned with several blasts of compressed air. Special attention is paid to areas where dust from grinding process is known to accumulate (e.g., between the plates and areas adjacent to the catch pan clamps). The catch pan is then reattached to the grinder. An approximate 20 g aliquot of quartz sand is then passed through the grinder to clean out any residual soil. The quartz sand is discarded and the grinder subjected to another round of high pressure air blasts. After this decontamination procedure, the grinder is ready to process the next sample.

9.0 SPLITTING OF THE FINE GROUND SAMPLE

Following the procedures outlined above, the fine ground soil sample should be distributed into four approximately equal subsamples using a splitter. The subsamples will be placed in a series of four tared, plastic ziplock bags. Identify the subsamples with the same sample label as the original "FG" sample. All splitting should be performed in the hood. The following method for splitting a soil sample was adapted from EPA 540-R-97-028 (USEPA, 1997).

Before placing samples in the hood verify that the hood is turned on and the ventilation system is operating properly (Attachment 4).

Open the sample bag and place the soil onto the splitter tray. Shake the tray to evenly distribute the sample. Place the long lip of the tray against the long lip of the splitter hopper and slowly rotate the tray so that the sample slowly empties into the splitter and slides down the near wall of the hopper to the chutes, collecting the sample in two receiving trays. Tap the sample tray vigorously several times to free any remaining material. Tap the splitter to facilitate the flow of all material through the chutes into the receiving trays. The corners and nooks of the splitter may be cleaned with a coarse nylon brush.

Set the material aside; this portion of fine ground sample will be split again as described below. The original sample tray (which is now empty), and the emptied receiving tray should be placed under the splitter as the new receiving trays.

Repeat the process of dispersing the remaining sample material (containing half the mass of the

TECHNICAL STANDARD OPERATING PROCEDURE

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original sample) by shaking the sample tray so that it is uniformly distributed. The splits are FG1 and FG2 on the Sample Preparation Log Sheet (Attachment 1). Repeat the procedure described above for splitting the sample material set aside (containing the other half of the original sample) to create FG3 and FG4. At the end of the second split, carefully transfer the material from each of the receiving trays into a clean, tared sample bags to be weighed and packaged for shipment to the analytical laboratory or archived, as directed.

10.0 DOCUMENTATION

Original Sample ID numbers are recorded on the Sample Preparation Log Sheet (Attachment 1) along with the corresponding new Index ID. Index IDs are also recorded on all sample containers.

The following equipment calibration and maintenance logs will also be maintained:

- daily analytical balance calibration using S-class weights (Attachment 2)
- daily grinder setting verification for calibration check and/or post-adjustment verification, grinder maintenance as necessary (Attachment 3)
- daily ventilation hood operating condition verification (i.e., inline filter checks, changes, HVAC system checks) (Attachment 4)
- HEPA vacuum maintenance and bag changes (Attachment 5)
- daily oven temperature calibration, oven maintenance as necessary (Attachment 6)

In addition, a field notebook will be maintained by each individual or team that is preparing samples. For each day that samples are processed, the following information should be collected:

- date
- time
- personnel
- descriptions of any deviations to the SOP and the reason for the deviation
- summary of laboratory activities

11.0 QUALITY ASSURANCE

At least one preparation blank will be processed with each batch (per oven) of field samples. A preparation blank is a bag of clean quartz sand that is dried along with the field samples. The preparation blank is assigned a random and unique index identification number and is submitted to the laboratory blind. Detection of asbestos fibers in any preparation blank should be taken as a

TECHNICAL STANDARD OPERATING PROCEDURE

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sign of potential cross-contamination, and steps should be taken to identify and address the source of the cross contamination.

One grinding blank, consisting of clean quartz sand, will be processed once per day on days that field samples are ground. The grinding blank is assigned a random and unique index identification number and is submitted to the laboratory blind. Detection of asbestos fibers in any grinding blank should be taken as a sign of potential cross-contamination, and steps should be taken to identify and address the source of the cross contamination.

One preparation duplicate sample will be processed for every 20 field samples prepared. A preparation duplicate is a second sample of material that is prepared in the same fashion as the primary sample. The material for the preparation duplicate is obtained by using the Jones splitter to divide the preparation sample into two equal sub-parts. The preparation duplicate is assigned a unique and random sample identification number, and is submitted to the laboratory in a blind fashion. The Sample Preparation Log Sheet (Attachment 1) should be used to record the identity of any field samples that are used to prepare blind duplicates, along with the random sample number assigned to the split sample.

12.0 DECONTAMINATION

All non-disposable equipment used during sample preparation must be decontaminated prior to use. Scoops or spoons, splitters, sieves and drying trays that are re-used must be decontaminated with compressed air and/or brushing off any residual material. If soil particles are visible on any of the equipment, repeat the decontamination procedure until the equipment is clean.

13.0 GLOSSARY

Project Plan - The written document that spells out the detailed site-specific procedures to be followed by the Project Leader and the Preparation Lab Personnel.

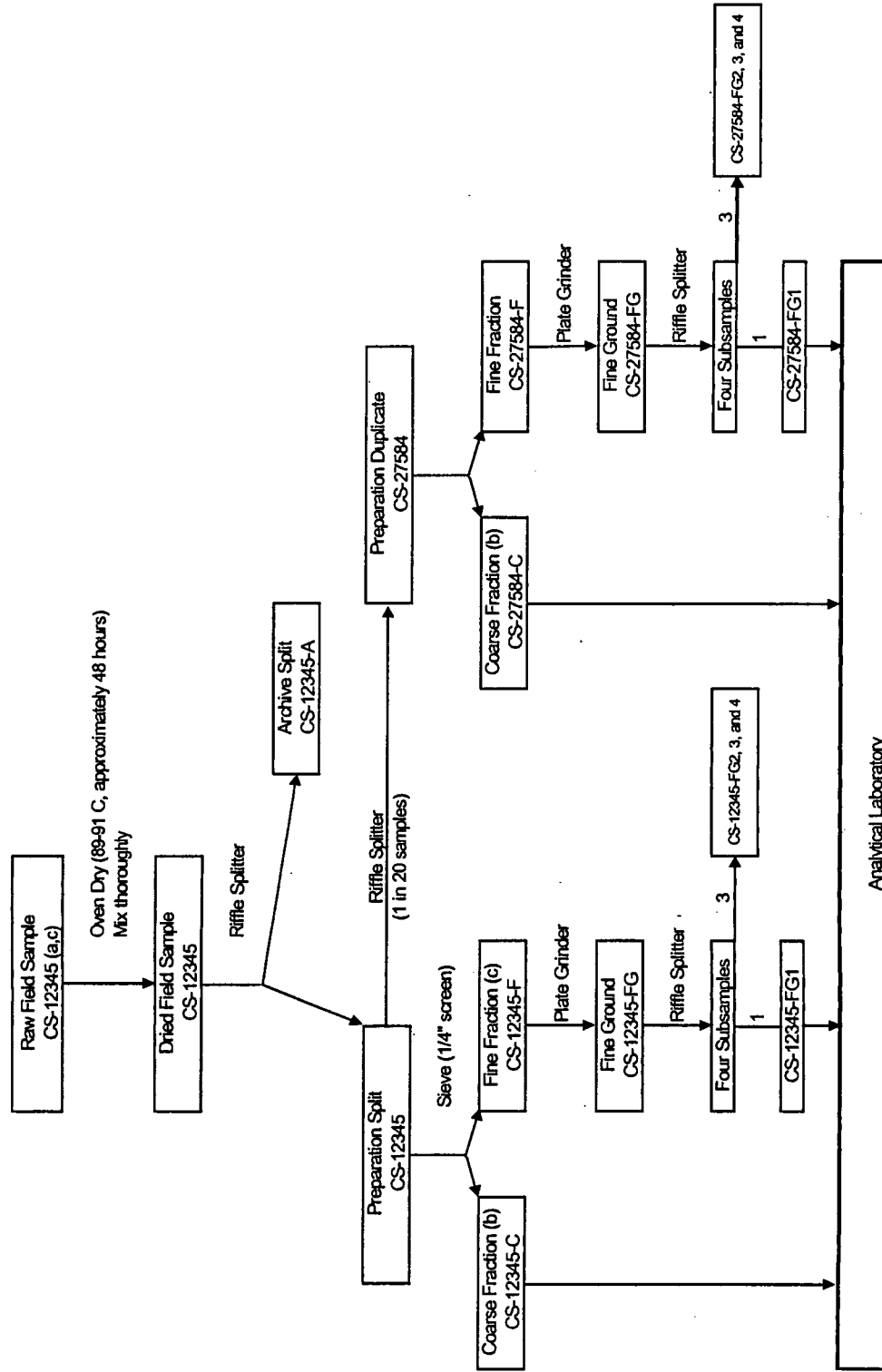
14.0 REFERENCES

American Society for Testing and Materials. 1998. Standard Practice for Reducing Samples of Aggregate to Testing Size, ASTM Designation: C 702 - 98, 4 p.

USEPA. 1997. Superfund Method for the Determination of Releasable Asbestos in Soils and Bulk Materials. EPA 540-R-97-028.

TECHNICAL STANDARD OPERATING PROCEDURE ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

Figure 1. Soil Sample Preparation Flow Diagram



(a) Example sample number shown to illustrate naming conventions

(b) Coarse sample will be returned to EPA for archive after laboratory analysis

(c) Preparation blanks (clean quartz sand) will be processed with each batch and subject to drying followed by fine fraction grinding. Intermediate steps do not apply

TECHNICAL STANDARD OPERATING PROCEDURE

ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

ATTACHMENT 1

SAMPLE PREPARATION LOG SHEET

TECHNICAL STANDARD OPERATING PROCEDURE ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

Sample Preparation Log Sheet

Prep Batch #: 98

Date/Time Drying Begun	
Date/Time Drying Completed	
Oven Temp (C)	

Sample ID	SOP and Rev Number	Sample Drying			Archive Sample Splitting Initials and Date	Duplicate Sample Splitting Initials and Date	Sieving			Sample Grinding Initials and Date	Sample Splitting					Archive Box Number	Original Sample Identification and Notes	
		Sample Mass (g)		Initials and Date			Sample Mass (g)	Sample Mass (g)	Sample Mass (g)		FG1	FG2	FG3	FG4	Initials and Date			
		Before	After															
1R-16069																98A		
1R-16070																	98A	
1R-16071																	98A	
1R-16072																	98A	
1R-16073																	98A	
1R-16074																	98A	
1R-16075																	98A	
1R-16076																	98A	
1R-16077																	98A	
1R-16078																	98A	
1R-16079																	98A	
1R-16123																	98A	
1R-16124																	98A	
1R-16125																	98A	
1R-16126																	98A	
1R-16127																	98A	
1R-16128																	98A	
1R-16129																	98A	
1R-16130																	98A	
1R-16161																	98A	

Reviewed By: _____ Date: _____ 4/26/2016, 1:14:30 PM Page 1 of 4

TECHNICAL STANDARD OPERATING PROCEDURE
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ATTACHMENT 2

ANALYTICAL BALANCE CALIBRATION AND MAINTENANCE LOG

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Analytical Balance Calibration and Maintenance Log

Balance Name/Model # =

Measurement Number	Calibration Weights:	S-Class Weight Measurements				Measurement within range? Yes or No	If "No" Recalibrate	Technician Initials
		0.1 g	1 g	10 g	100 g			
	Tolerance Limit Range:	NA	0.9 - 1.1 g	9.9 - 10.1 g	99.9 - 100.1 g			
Date								
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

The analytical balance calibration will be verified daily.

The tolerance limit range represents the standard mass +/- 0.1 g.

After 20 measurements, the tolerance range will be evaluate for reasonableness.

Weights falling outside the range requires that the balance be recalibrated using all S-class

TECHNICAL STANDARD OPERATING PROCEDURE
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ATTACHMENT 3

GRINDER CALIBRATION AND MAINTENANCE LOG

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[illegible]

M = Maintenance Only

Failure of either sieve test requires adjustment of the plates followed by adjustment verification prior to grinding samples.

TECHNICAL STANDARD OPERATING PROCEDURE

ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

ATTACHMENT 4

VENTILATION HOOD CALIBRATION AND MAINTENANCE LOG

ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

[illegible]

TECHNICAL STANDARD OPERATING PROCEDURE
ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

ATTACHMENT 5

VACUUM MAINTENANCE LOG

ISSI-LIBBY-01, Revision 6: SOIL SAMPLE PREPARATION

[illegible]

TECHNICAL STANDARD OPERATING PROCEDURE
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ATTACHMENT 6

OVEN TEMPERATURE CALIBRATION AND MAINTENANCE LOG

TECHNICAL STANDARD OPERATING PROCEDURE

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Oven Temperature Calibration and Maintenance Log

Date	Certified Temperature Reading (°C)	Thermometer ID	System check Acceptable? 90°C (±1°C) Yes or No	Notes or other items (include description of maintenance performed)	Technician Initials

Appendix C

CDM-LIBBY-06

Project-Specific SOP CSF eLASTIC Module

Libby2 (V2) – Project database

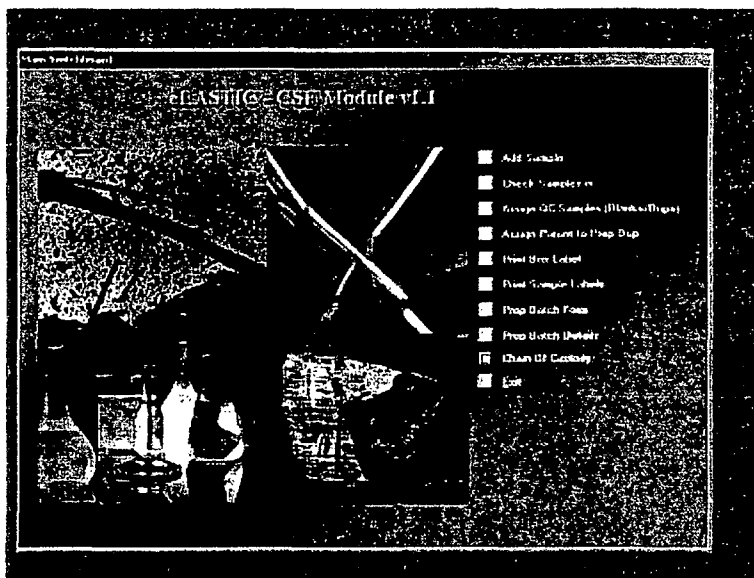
Prior to beginning data entry steps detailed below, all samples received in a shipment must be check against the accompanying chain-of-custody (COC).

If there are any issues regarding the COC versus the contents of the shipment, CSF personnel must contact the Libby sample coordination staff to correct the issue prior to initiating sample preparation or data entry into eLASTIC. Any changes to the COC need to be communicated to Volpe to ensure Libby2 database is accurate and complete.

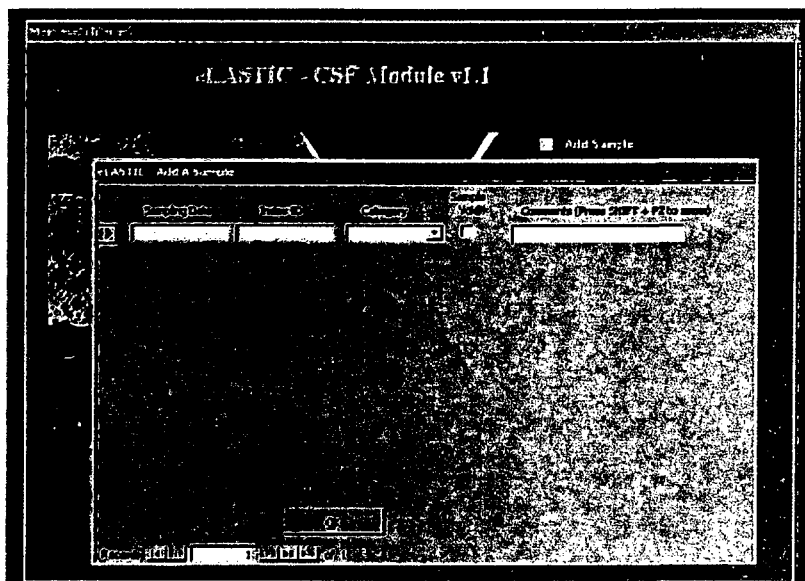
Step 1: Create Quality Control Samples

The first step of data entry into eLASTIC is to enter index ids as place holders for quality control (QC) samples that will be associated with each sample preparation batch. These include preparation blank (1 per batch) and preparation duplicate (1 per 20) samples. Creation of the actual samples will occur following the drying step (ISSI-LIBBY-01 Rev. 5).

1. Select Add Sample from the *Main Switchboard*.



2. This will take the user to the *Add A Sample* screen.



3. In the sampling date field, enter the sample date in the form mm/dd/yy. Preparation duplicate sample dates must be the same as their parent sample. Preparation blank and grinding blank sample dates must be the date the sample is entered in eLASTIC.
4. In the index ID field, enter the index identification number (index ID) of the QC sample being created.

Note: A list of index ID numbers will be provided to the CSF manager by the sample coordinator on an as-needed basis.

5. For the category field, select the type of QC sample from the drop down list.
PB = preparation blank
PD = preparation duplicate
GB = grinding blank

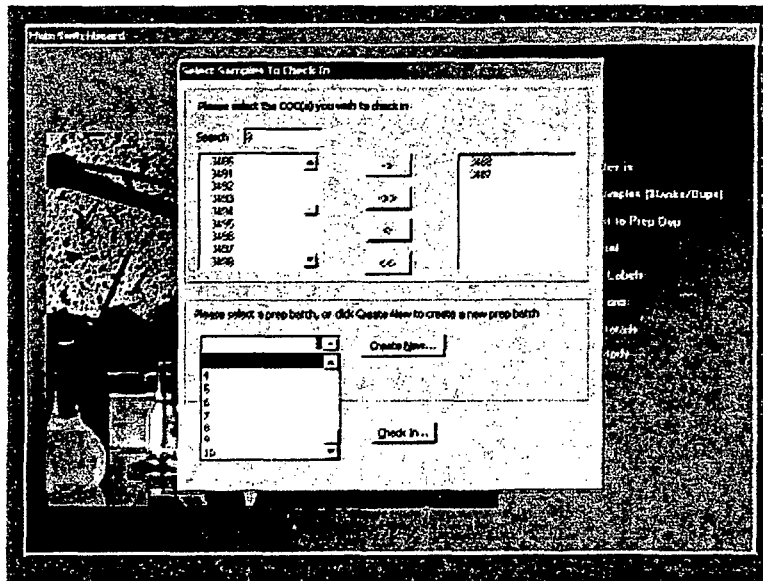
Note: An index ID number can be voided at anytime using the sample void box.

6. Enter any comments in the comments field. If an index ID number is voided, an explanation should be included in the comments field.
7. Exit screen by clicking OK.

Step 2: Check Samples In

Once QC index IDs have been created for a batch of samples, samples are checked into eLASTIC and assigned to a preparation batch.

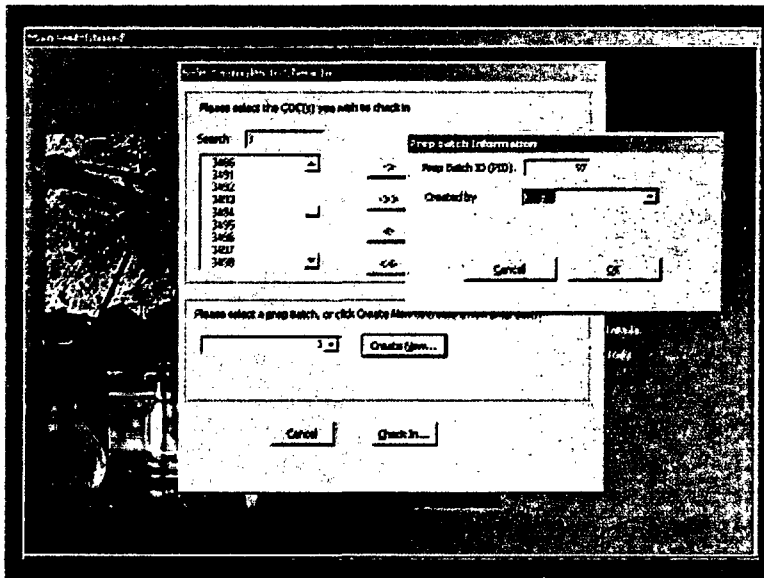
1. Select Check Samples In from the *Main Switchboard*. This will take the user to the *Select Samples to Check In* screen.



2. Move the COC form number of the to be checked in from the left list group to the list on the right by clicking on the right arrow button.

Note: A COC number can be removed from the right list by selecting the COC number and clicking the left arrow button.

3. Once the COCs are selected, the user needs to create a new batch by clicking Create New.... This will bring up the prep batch information screen. The prep batch identification number and date and time of creation will be automatically assigned. Use the drop down menu to select the name of the person creating the batch. Once all fields have been completed, click OK.



4. This returns the user to the *Select Samples to Check In* screen. Use the drop down menu to select the number of the preparation batch.
5. To complete the check-in process, click Check In....
6. This takes the user to the *Sample Check-In* screen. Using this screen compare the Libby COC to the sample index ID numbers. Check in each sample in the batch. If there are any issues regarding the index IDs appearing on the *Sample Check-In* screen versus the Libby COC, CSF personnel must contact Libby sample coordination personnel to correct the issue in their system. Then the issue must be corrected in the sample check-in list. 6a and 6b describe the procedures for correcting the sample check-in list.
 - a. Samples that are in the cooler, and not in eLASTIC
 - i. Add the sample to the check-in list by selecting the index id from the Index ID drop down box. Type in the COC number.
 - b. Samples that are in eLASTIC, and not in the cooler

- i. Uncheck the Checked In box for the index id that is not in the cooler.

Please review the samples that will be checked in and assigned a Prep Batch.

CQC	Index ID	Checked In	PID	Comments
3487	CS-06004	<input checked="" type="checkbox"/>		
3487	CS-06005	<input checked="" type="checkbox"/>		
3487	CS-06006	<input checked="" type="checkbox"/>		
3487	CS-06007	<input checked="" type="checkbox"/>		
3487	CS-06008	<input checked="" type="checkbox"/>		
3487	CS-06009	<input checked="" type="checkbox"/>		
3487	CS-06010	<input checked="" type="checkbox"/>		
3487	CS-06011	<input checked="" type="checkbox"/>		
3487	CS-06012	<input checked="" type="checkbox"/>		
3487	CS-06013	<input checked="" type="checkbox"/>		

Records: 14 of 17

Data samples checked in: [CS-06013]

Updated by: [User]

[Cancel Batch] [Post Batch]

7. Add QC samples to the preparation batch by selecting an empty row. Use the drop down menu to select the index IDs of the QC samples to be included in the batch. The checked in box and preparation identification (PID) column will automatically be updated to reflect the current preparation batch.
8. Use the drop down list to select the name of the user this information was updated by.
9. Click Post Batch to group the selected samples and QC samples as a batch. A Sample Check-In Report will be printed summarizing the check-in procedure. Place this document in the batch folder.

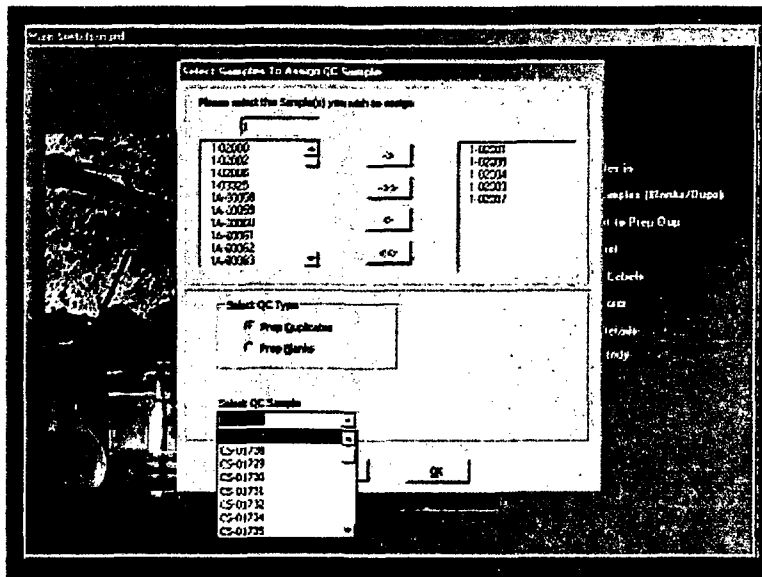
Sample Check-In Report

Sample ID	Index ID	Checked In	PID	Comments
3487	CS-06004	<input checked="" type="checkbox"/>		
3487	CS-06005	<input checked="" type="checkbox"/>		
3487	CS-06006	<input checked="" type="checkbox"/>		
3487	CS-06007	<input checked="" type="checkbox"/>		
3487	CS-06008	<input checked="" type="checkbox"/>		
3487	CS-06009	<input checked="" type="checkbox"/>		
3487	CS-06010	<input checked="" type="checkbox"/>		
3487	CS-06011	<input checked="" type="checkbox"/>		
3487	CS-06012	<input checked="" type="checkbox"/>		
3487	CS-06013	<input checked="" type="checkbox"/>		

Step 3: Assign QC Samples

Once QC samples and a preparation batch have been created, the QC samples must be assigned to the corresponding samples in each batch (preparation duplicates [1/20], preparation blanks [1/batch]).

1. Select Assign QC Samples from the *Main Switchboard*.

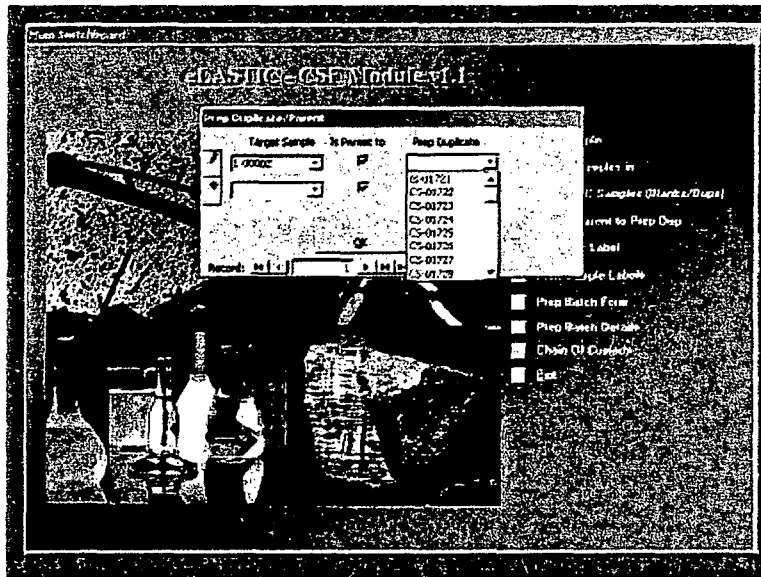


2. Move the target samples associated with QC samples from the list on the left to the right list.
3. Select the QC sample type.
4. Select the index ID of the QC sample that will be associated with the field sample from the drop down list.
5. Click OK after each field/QC sample pair association is created. Repeat steps 2-5 for each QC sample assignment.
6. Exit screen by clicking Close.

Step 4: Assign Parent Sample to Preparation Duplicate Sample

In Step 3, each field sample in the batch was associated to the appropriate preparation duplicate and preparation blank sample. The purpose of Step 4 is to assign the preparation duplicate sample to the parent target sample.

1. Select Assign Parent Sample to Prep Dup from the *Main Switchboard*.
2. Using the drop down list on the left, select the parent target sample index ID number.



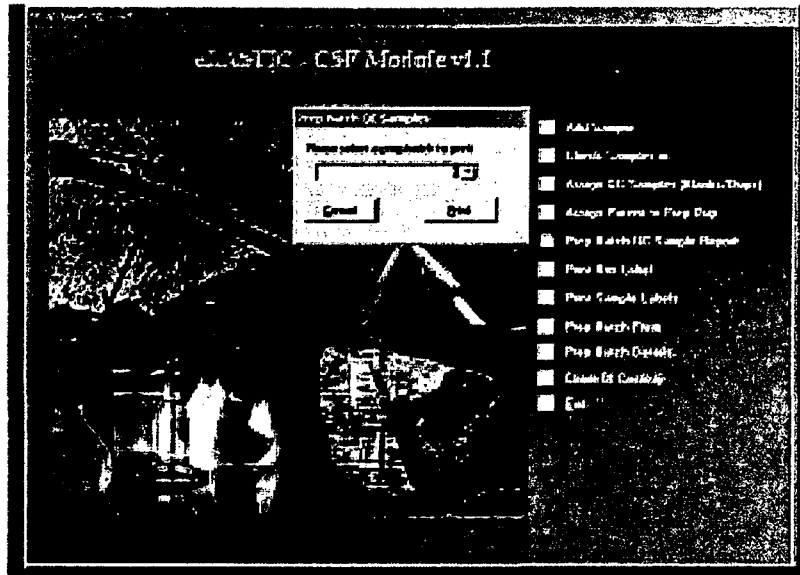
3. Select the corresponding index ID of the preparation duplicate sample from the list on the right
4. Repeat steps 2 and 3 until all preparation duplicate samples in the batch have been assigned to parent samples.

Note: To delete a record click the record selector on the left and strike the delete key.

5. Exit screen by clicking OK

Step 5a: Print Prep Batch QC Sample Report

Once the samples have been checked in, a Prep Batch QC Sample Report, box labels, sample labels, and a Prep Batch Form need to be printed. To print the Prep Batch QC Sample Report for a specific batch, follow the directions below:



1. Select Prep Batch QC Sample Report from the *Main Switchboard*.
2. Use the drop down list to select the prep batch number.
3. Click Print

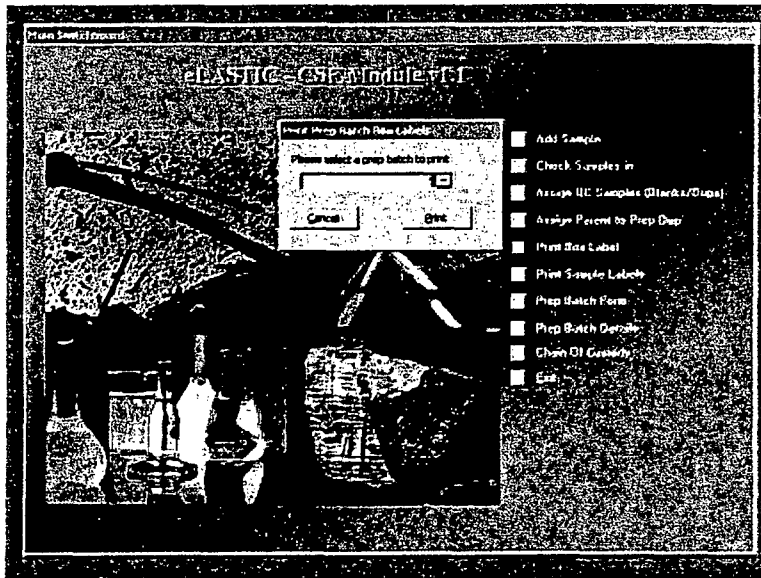
Prep Batch QC Sample Check Report

Batch	Sample	Batch	Sample	Batch	Sample
1	100000	11	100000	21	100000
2	100000	12	100000	22	100000
3	100000	13	100000	23	100000
4	100000	14	100000	24	100000
5	100000	15	100000	25	100000
6	100000	16	100000	26	100000
7	100000	17	100000	27	100000
8	100000	18	100000	28	100000
9	100000	19	100000	29	100000
10	100000	20	100000	30	100000
11	100000	21	100000	31	100000
12	100000	22	100000	32	100000
13	100000	23	100000	33	100000
14	100000	24	100000	34	100000
15	100000	25	100000	35	100000
16	100000	26	100000	36	100000
17	100000	27	100000	37	100000
18	100000	28	100000	38	100000
19	100000	29	100000	39	100000
20	100000	30	100000	40	100000
21	100000	31	100000	41	100000
22	100000	32	100000	42	100000
23	100000	33	100000	43	100000
24	100000	34	100000	44	100000
25	100000	35	100000	45	100000
26	100000	36	100000	46	100000
27	100000	37	100000	47	100000
28	100000	38	100000	48	100000
29	100000	39	100000	49	100000
30	100000	40	100000	50	100000
31	100000	41	100000	51	100000
32	100000	42	100000	52	100000
33	100000	43	100000	53	100000
34	100000	44	100000	54	100000
35	100000	45	100000	55	100000
36	100000	46	100000	56	100000
37	100000	47	100000	57	100000
38	100000	48	100000	58	100000
39	100000	49	100000	59	100000
40	100000	50	100000	60	100000
41	100000	51	100000	61	100000
42	100000	52	100000	62	100000
43	100000	53	100000	63	100000
44	100000	54	100000	64	100000
45	100000	55	100000	65	100000
46	100000	56	100000	66	100000
47	100000	57	100000	67	100000
48	100000	58	100000	68	100000
49	100000	59	100000	69	100000
50	100000	60	100000	70	100000
51	100000	61	100000	71	100000
52	100000	62	100000	72	100000
53	100000	63	100000	73	100000
54	100000	64	100000	74	100000
55	100000	65	100000	75	100000
56	100000	66	100000	76	100000
57	100000	67	100000	77	100000
58	100000	68	100000	78	100000
59	100000	69	100000	79	100000
60	100000	70	100000	80	100000
61	100000	71	100000	81	100000
62	100000	72	100000	82	100000
63	100000	73	100000	83	100000
64	100000	74	100000	84	100000
65	100000	75	100000	85	100000
66	100000	76	100000	86	100000
67	100000	77	100000	87	100000
68	100000	78	100000	88	100000
69	100000	79	100000	89	100000
70	100000	80	100000	90	100000
71	100000	81	100000	91	100000
72	100000	82	100000	92	100000
73	100000	83	100000	93	100000
74	100000	84	100000	94	100000
75	100000	85	100000	95	100000
76	100000	86	100000	96	100000
77	100000	87	100000	97	100000
78	100000	88	100000	98	100000
79	100000	89	100000	99	100000
80	100000	90	100000	100	100000

Step 5b: Print Box Labels

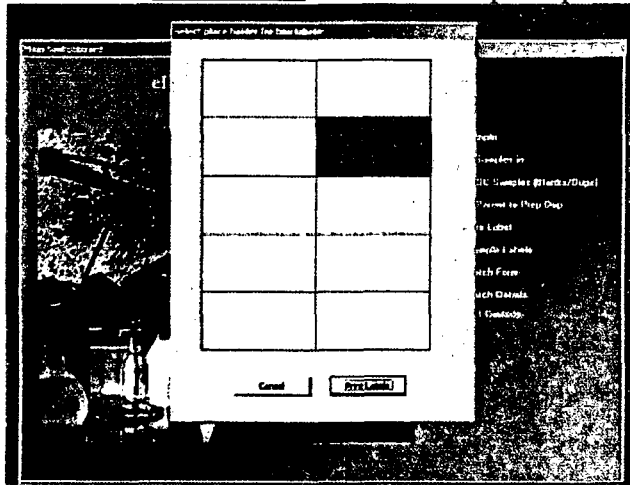
Box labels are printed on the Avery 5163 labels. To print the box labels for a specific batch, follow the directions below:

1. Select Print Box Label from the *Main Switchboard*.

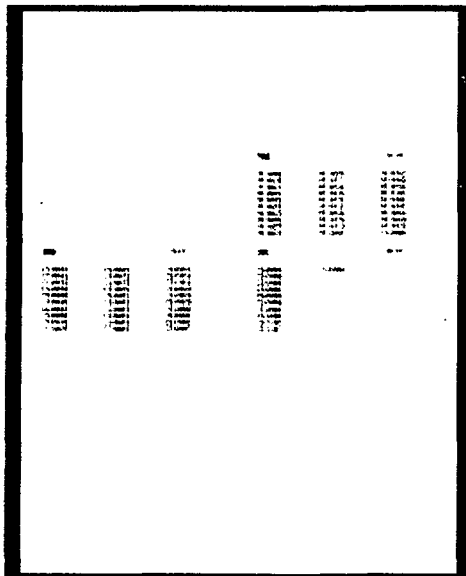


2. Use the drop down list to select the prep batch number.
3. Click Print.
4. Place the label sheet in the printer.
5. Select the rectangle where the labels will start.

6. Click Print Labels to review the print preview screen. If corrections are

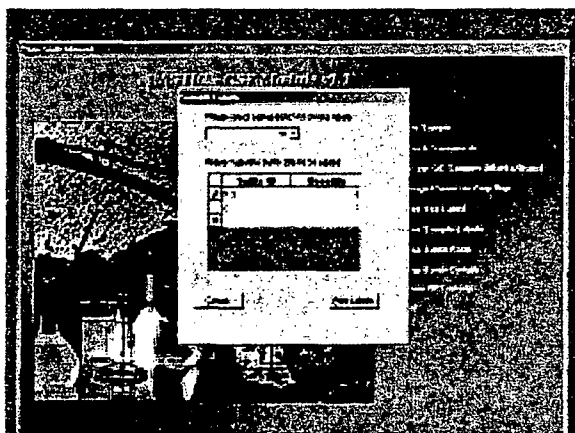


needed close the preview screen and make appropriate corrections; otherwise, print the labels by clicking the print icon on the upper left toolbar.

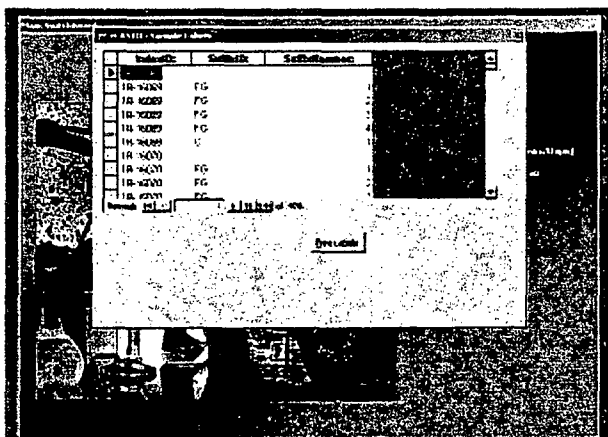


Once the box labels have been printed, sample labels need to be printed. Sample labels are printed on the Avery 5267 labels. Step 5c describes how to create labels for each sample fraction (C, B, F, FG, FG, etc...) for each sample in a batch.

1. Select Print Sample Labels from the *Main Switchboard*.
2. Using the drop down list, select the prep batch number to print sample labels for.



3. Enter each suffix id needed (e.g., C, FG, AFG, etc...) in the Suffix ID column.
4. Enter the quantity of each suffix needed in the Quantity column. For example, to print a label for FG1, FG2, FG3, and FG4 the quantity will be 4.
5. Click Print to review labels. If corrections are needed close the preview screen

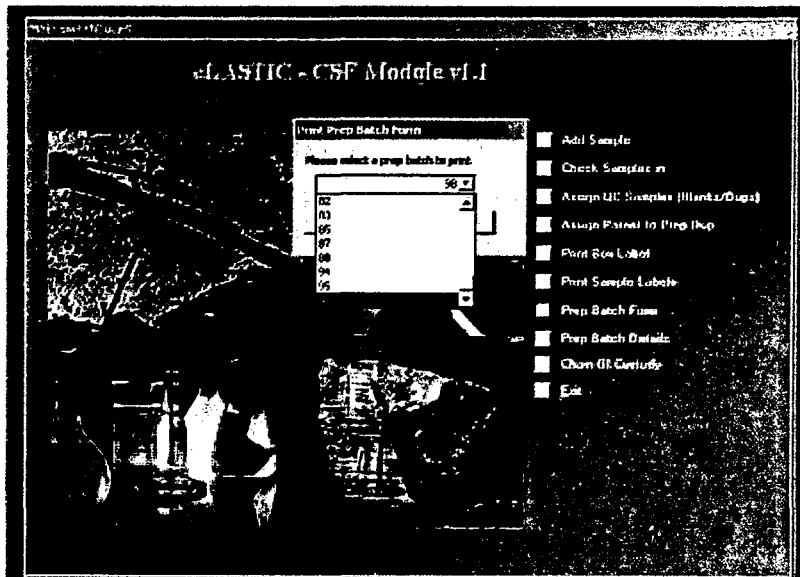


and make appropriate corrections; otherwise, print the labels by clicking the print icon on the upper left toolbar.

Step 6: Print Sample Preparation Log Sheet

Using the information entered regarding field and QC samples assigned to a batch, eLASTIC creates the sample preparation log sheet that documents the drying, split, and grinding of each sample in the batch. This log sheet is to be used during the preparation process to record prep information. To print the sample preparation log sheet for a specific batch, follow the directions below:

1. Select Prep Batch Form from the *Main Switchboard*.



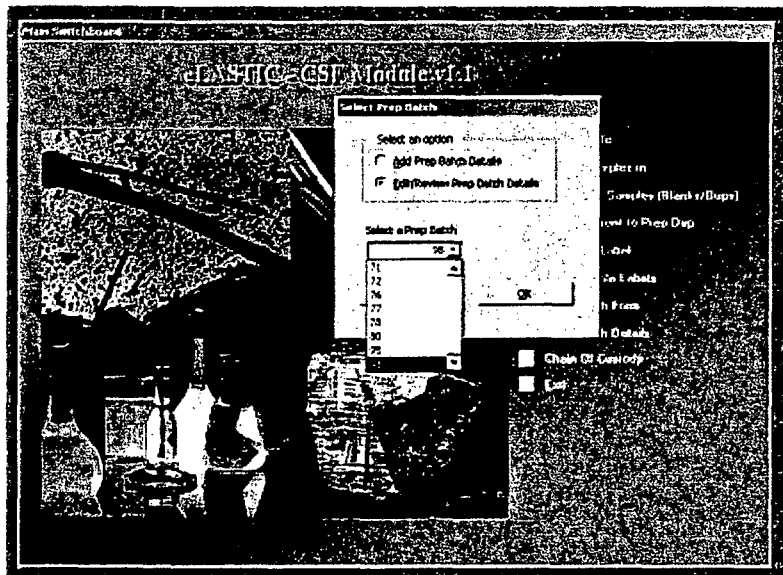
2. Use the drop down list to select the number of the sample preparation log sheet.
3. Select Print.

Step 7: Preparation Batch Details

Once the samples have gone through the preparation process, the information from the hard copy sample preparation log sheet must be entered into eLASTIC. This step describes how this should be done.

1. Select Prep Batch Details from the *Main Switchboard*.
2. To add details to a preparation batch for that has not previously been entered, select Add Prep Batch Details. Use the drop down list to select the number of the preparation batch to enter data for. Then click OK.

Note: Preparation batch detail can be edited by selecting Edit Prep Batch Details. Using the drop down menu, select the number of the prep batch to edit. Then select OK.



- On the *Prep Batch Information* screen enter the date/time drying began in the form mm/dd/yy_ hh:mm in military time. Enter date/time drying completed in the form mm/dd/yy_ hh:mm in military time. Enter oven temperature in degrees centigrade (°C). Click Continue.... This will take the user to the *Sample Preparation Log Sheet*.

eLASTIC - CSF Module v1.1

Prep Batch Information

Please enter the batch information

Prep Batch ID: [03]
 Date/Time Drying Began: [11/01/07]
 Date/Time Drying Completed: [11/01/07]
 Oven Temp (°C): [100]

Buttons: Cancel, Continue....

Checkboxes: Prep Batch Details, Chain Of Custody, Log

- Complete the *Sample Preparation Log Sheet*. When finished click Post Batch.

Sample Preparation Log Sheet

Prep Batch ID: [03]
 Date/Time Drying Began: [11/01/07]
 Date/Time Drying Completed: [11/01/07]
 Oven Temp (°C): [100]

Sample ID	Date	Time	Sample Name	Sample Type	Sample Location	Sample Status	Sample Notes	Sample Comments
2011000	11/01/07	11:00	11/01/07	11:00	11/01/07	11:00	11/01/07	11/01/07
2011001	11/01/07	11:01	11/01/07	11:01	11/01/07	11:01	11/01/07	11/01/07
2011002	11/01/07	11:02	11/01/07	11:02	11/01/07	11:02	11/01/07	11/01/07
2011003	11/01/07	11:03	11/01/07	11:03	11/01/07	11:03	11/01/07	11/01/07
2011004	11/01/07	11:04	11/01/07	11:04	11/01/07	11:04	11/01/07	11/01/07
2011005	11/01/07	11:05	11/01/07	11:05	11/01/07	11:05	11/01/07	11/01/07
2011006	11/01/07	11:06	11/01/07	11:06	11/01/07	11:06	11/01/07	11/01/07
2011007	11/01/07	11:07	11/01/07	11:07	11/01/07	11:07	11/01/07	11/01/07
2011008	11/01/07	11:08	11/01/07	11:08	11/01/07	11:08	11/01/07	11/01/07
2011009	11/01/07	11:09	11/01/07	11:09	11/01/07	11:09	11/01/07	11/01/07
2011010	11/01/07	11:10	11/01/07	11:10	11/01/07	11:10	11/01/07	11/01/07

Buttons: Post Batch, Print Batch, Exit Batch

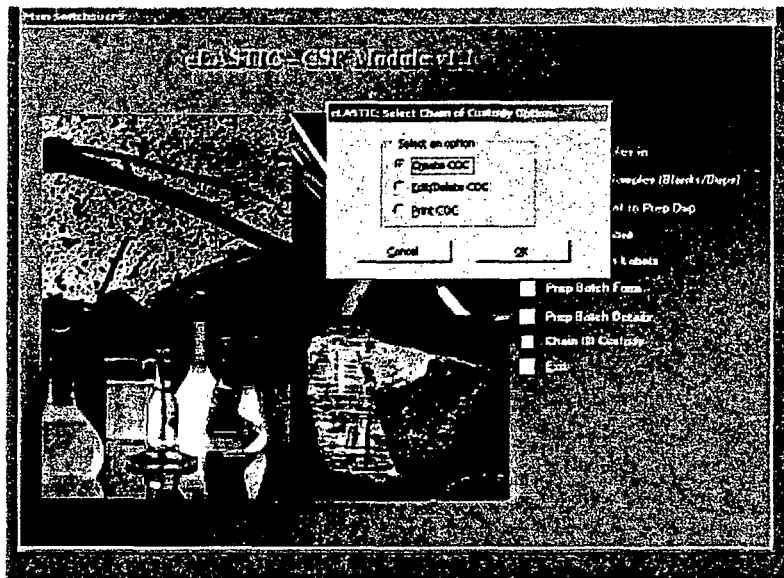
Step 8: Chain-of-Custody

Step 8 describes the procedures for creating, editing/deleting/ and printing chain-of-custody forms.

Note: Chain-of-Custody forms can not be created until preparation batch details are entered (Step 7).

Create Chain-of-Custody

1. Select Chain Of Custody from the *Main Switchboard*.
2. On the *Select Chain of Custody Option* screen, select create COC. Then click OK.



3. The chain-of-custody number will automatically be filled in by eLASTIC.

Sample ID	Lab	Method	Company	Shipping Number	Shipping Date	Index ID	Prep Batch Number	Suffix ID	Suffix Number	Sample Date	Sample Time	Sample Matrix	Mass Fraction	Turn Around Time	Analysis Requested
1	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
2	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
3	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103
4	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104
5	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
6	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106
7	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107
8	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108
9	109	109	109	109	109	109	109	109	109	109	109	109	109	109	109
10	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110

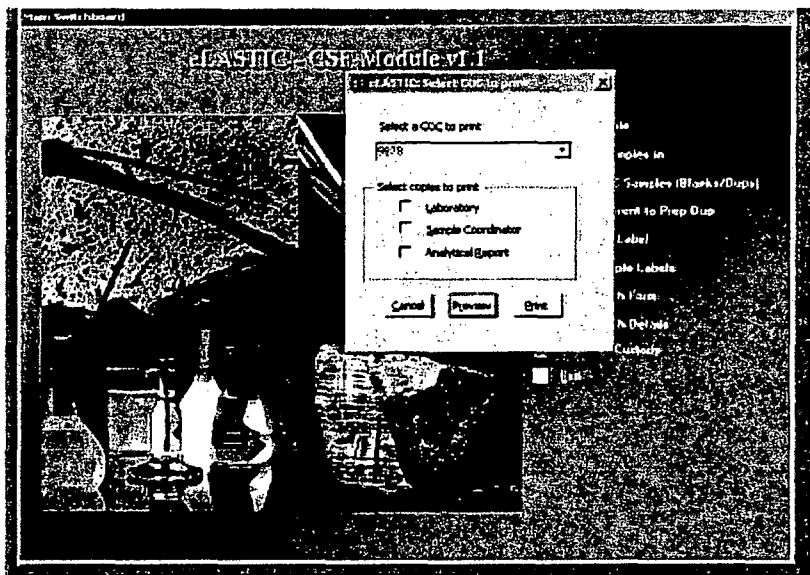
4. Select the laboratory that will receive the samples from the drop down list.
5. In the Via area, select the method that will be used to deliver the samples to the laboratory.
6. Complete the shipping information by filling in the company, shipping number, and shipping date.
7. Complete the Index ID field using the drop down list to select the index ID. The prep batch number, suffix ID, suffix number, sample date, sample time, sample matrix, and mass fraction will automatically be completed.
8. Complete the turn around time by typing in the appropriate number of days or hours. Then select the appropriate units from Turn Around Time Units.
9. Complete the analysis requested field using the drop down list.
10. Enter any desired comment in the comments field.
11. When chain-of-custody data entry is complete, click OK.

Edit/Delete a Chain of Custody

1. Select Chain Of Custody from the *Main Switchboard*.
2. Select Edit/Delete COC from the *Select Chain of Custody Option* screen.
3. Select the COC number to edit or delete.
4. Make edits. Then click OK.
5. To delete the COC, click Delete. *Note: All chain of custody information will be deleted from the database by clicking Delete.*

Print a Chain of Custody

1. Select Chain Of Custody from the *Main Switchboard*.



2. Select Print COC from the *Select Chain of Custody Option* screen.
3. Select the COC number and COC copies to print on the *Select COC to Print* screen. Then click Preview.
4. Click Preview to review the COC. If corrections are needed close the preview screen, and click Cancel on the *Select COC to Print* screen. Make appropriate corrections (see Edit/Delete a Chain of Custody). If not corrections are needed then print the COC by clicking Print on the *Select COC to Print* screen.

Exports

Prep Batch Data

Volpe will generate field data sheets for all preparation quality control samples. The CSF will provide an electronic deliverable of preparation data to Volpe for upload into V2.

Quality Control Sample Data

The CSF will provide an electronic deliverable of quality control sample data and their related sample data to Volpe for upload into V2.

COC Data

The CSF will provide an electronic deliverable of chain of custody data to Volpe for upload into V2.

Database Backups

The database will be backed up daily onto a zip disk. An off site backup will be completed once per week.

Security

The application will require users to log on. Each user is given an account that has levels of security based on that user's needs.

All database activities performed outside the application's SOP must be approved by the system manager in writing. Certain tasks may be approved permanently. Once a task has been approved permanently, the user will not need to get further approval for that task. If the task is not approved for permanent approval, the user must get approval each time the task needs to be performed.

Database Updates

The sample table (tblSample) will be updated weekly. This procedure will be completed under the discretion of the system manager.

QA/QC

See section 3.4.5.3 of the *Libby CSS Soil Preparation Plan*.

Data Dictionary v1.1

TableName	Module	Field	Description	Datatype	Length	Nulls	Default	Identity	Increment
refAnalysis	Field/CSF	Analysis	Analytical Method requested	Text	50	0		1	0
		SeqNum	Unique row identifier	int	4	0		1	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
		MIN	Unique numeric representation of eLASTIC user	int	4	0		1	0
refeLASTICMembers	Field/CSF	FirstName	First name of user	Text	100	1		0	0
		LastName	Last name of user	Text	100	0		0	0
		Initials	Initials of user	Text	5	0		0	0
		Organization	Organization user is associated with	Text	50	1		0	0
		Phone	Phone number of user (work)	Text	10	1		0	0
		email	Email address of user	Text	50	1		0	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
refLaboratory	Field/CSF	Lab	Laboratory where sample is sent	Text	50	0		1	0
		Address	Mailing address of lab	Text	100	1		0	0
		City	City	Text	50	1		0	0
		State	State	Text	2	1		0	0
		PostalCode	Zip code	Text	10	1		0	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
		SeqNum	Unique row identifier	int	4	0		1	0
refPrepSOP	Field/CSF	SOP	SOP and Revision used for prep process	Text	50	0		1	0
		Description	Description of SOP	Text	255	1		0	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
		SeqNum	Unique row identifier	int	4	0		1	0
refSampleMedia	Field/CSF	SampleMedia	Sample media	Text	50	0		1	0
		SeqNum	Unique row identifier	int	4	0		1	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
refSampleType	Field/CSF	SampleQCType	Abbreviation of QC Type	Text	50	0		1	0
		SampleQCTypeDesc	Description of sample qc type	Text	50	1		0	0
		SeqNum	Unique row identifier	int	4	0		1	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
refShippingCompany	Field/CSF	ShippingCompanyName	Name of carrier	Text	50	0		1	0
		ShippingCompanyPhone	Contact phone	Text	15	1		0	0
		SeqNum	Unique row identifier	int	4	0		1	0
refTurnAroundTimeUnits	Field/CSF	TurnAroundTimeUnits	Turn around time units	Text	10	0		1	0
		SeqNum	Unique row identifier	int	4	0		1	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
		SeqNum	Unique row identifier	int	4	0		1	0
tblPrepBatch	CSF	PID	Unique numeric representation of Prep batch	int	4	0		1	0
		DryBatchDateBegin	Start date of prepping	dateTime	8	1		0	0
		DryBatchDateEnd	Final date of prepping	dateTime	8	1		0	0
		OvenTemp_C	Temperature of oven	int	4	1		0	0
		User	User who added record	Text	50	1		0	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
		SeqNum	Unique row identifier	int	4	0		1	0
tblPrepBatchSample	CSF	IndexID	Sample identifier	Text	50	0		1	0
		PID	Unique numeric representation of Prep batch	int	4	0		1	0
		SOP	SOP used to prep sample	Text	50	1		0	0
		ArchivePortion	Flags if sample is archive portion	boolean	1	0	FALSE	1	0
		DrySampleDate	Date sample is dried	dateTime	8	1		0	0
		DrySamplePerson	Person drying sample	int	4	1		0	0
		ArchiveDate	Date archive sample taken	dateTime	8	1		0	0
		ArchivePerson	Person who takes archive sample	int	4	1		0	0
		CoarseMass_g	Weight of coarse material in grams	decimal	16	1		0	0
		FineMass_g	Weight of fine material in grams	decimal	16	1		0	0
		SieveDate	Date sample is sieved	dateTime	8	1		0	0
		SievePerson	Person who sieves sample	int	4	1		0	0
		GrndDate	Date sample is ground	dateTime	8	1		0	0
		GrndPerson	Person who grounds sample	int	4	1		0	0
		SplitDate	Date sample is split	dateTime	8	1		0	0
tblPrepBatchSampleDetail	CSF	SplitPerson	Person who splits sample	int	4	1		0	0
		BoxID	Box id	Text	10	1		0	0
		BPID	Box ID counter	int	4	1		0	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
		Comment	Comments	Text	255	1		0	0
		PBSID	Unique numeric representation of prepbatch/sample	int	4	0		1	0
		PBSIDQ	Unique numeric representation of sample detail	int	4	0		1	0
		PBSID	Unique numeric representation of prepbatch/sample	int	4	0		1	0
		SuffixID	Suffix for index id	Text	50	0		1	0
		SuffixNumber	Suffix number for index id	int	8	0		0	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
		IndexIDTarget	Sample identifier of target sample	Text	50	0		1	0
		IndexIDQCSample	Sample identifier of QC sample	Text	50	0		1	0
		IsParent	Flags sample if it is parent of qc sample	yes/no	1	0	no	0	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
tblSample	Field/CSF	SeqNum	Unique row identifier	int	4	0		1	0
		IndexID	Sample identifier	Text	50	0		1	0
		ChargeNumber	Charge number assigned to sample	Text	50	0		1	0
		FieldDataSheetNumber	Field data sheet number	Text	50	1		0	0
		COC	Chain of custody	Text	50	1		0	0
		SampleType	Abbreviation of QC Type	Text	50	0		1	0
		SampleMedia	Sample media	Text	50	0		1	0
		DateCollected	Date sample is collected	dateTime	8	0		0	0
		SampleTeam	Team that took sample	Text	50	0		1	0
		SampleVoid	Flags sample if void	yes/no	1	0	no	0	0
		SampleComments	Comments	Text	255	1		0	0
		Easting	Easting (x coordinate)	number	18	1		0	0
		Northing	Northing (y coordinate)	number	18	1		0	0
		Projection	Projection used for coordinates	Text	50	1		0	0
		Geocode	Geocode sample is associated with	Text	50	1		0	0
tblSampleIDTemp	CSF	DOE	Date/time record is added	dateTime	8	0	now()	0	0
		SeqNum	Unique row identifier	int	4	0		1	0
		SuffixID	Suffix ID used to identify sieving	Text	50	1		0	0
		Quantity	Number of labels to print	number	4	0		0	0
tblCOC	CSF	COCID	Chain of custody number	Text	50	0		1	0
		COCIDSub	Identifies CSF chain of custody	Text	1	0	"0"	1	0
		Lab	Laboratory where sample is sent	Text	50	1		0	0
		Delivery	Delivery type (1 = hand, 2 = shipped)	int	4	1		0	0
		Createdby	Person who created COC	Text	50	1		0	0
		ShippingNumber	Air bill number	Text	50	1		0	0
		ShippingCompany	Carrier name	Text	50	1		0	0
		ShippingDate	Date COC is shipped	dateTime	8	1		0	0
		SeqNum	Unique row identifier	int	4	0		1	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0
tblCOCDetail	CSF	COCID	Chain of custody number	Text	50	0		1	0
		COCDetailID	Unique numeric representation of COC detail	int	4	0		1	0
		PBSIDQ	Unique numeric representation of sample detail	int	4	0		1	0
		TurnAroundTime	Time expected to have analyzed	int	4	0		1	0
		TurnAroundTimeUnits	Turn around time units	Text	10	1		0	0
		Analysis	Analytical Method requested	Text	50	1		0	0
		Comment	Comments	Text	255	1		0	0
		DOE	Date/time record is added	dateTime	8	0	now()	0	0

Appendix D

CDM SOP 2-1

Packaging and Shipping of Environmental Samples

Project-Specific Modification

SOP No.: 2-1

SOP Title: Packaging and Shipping of Environmental Samples

Project: Libby Asbestos Remedial Investigation - Contaminant Screening Study (CSS)

Project No.: 3282-116

Client: U.S. Environmental Protection Agency

Project Manager: [Signature]

Date: 5/3/02

Technical Reviewer: [Signature]

Date: 5/3/02

QA Reviewer: [Signature]

Date: 5/8/02

EPA Approval: [Signature]

Date: 5/7/02

Reason for and duration of modification: Procedures for shipping environmental samples for the Libby asbestos project vary slightly from CDM Technical SOP 2-1. These modifications are necessary for the entire duration of the project.

Samples collected during this investigation will be packaged and shipped in accordance with CDM Technical SOP 2-1, with the following modifications:

Section 1.4. Required Equipment - Vermiculite (or other absorbent material), bubble wrap, or ice will not be used for packaging or shipping samples.

Section 1.5. Procedures - Lining the cooler with a garbage bag is determined not to be necessary since the samples will already be double-bagged. No vermiculite or other absorbent material will be used to pack the samples. No ice will be used.



Request for Modification to the

Libby Sampling and Quality Assurance Project Plan

Instructions to Requester: Fax to contacts at bottom of form for review and approval.

It is requested that you provide the following information to the EPA Region 5 office.

Project: WAPT (circle one), Phase I (approved 5/00), b (approval pending), c (approval pending)
Phase I (approved 4/00) Phase II (approved 2/01)
Removal Action (approved 7/00) CSS (approval 5/02)

Scenario No. (circle one): 1 2 3 4 NA

Requester: Dee Warren
Company: CDM

Title: CSS Task Leader
Date: 7-15-02

Description of Deviation:

Soil samples will be shipped in cooler lined with garbage bags. The garbage bags will be sealed with a rusted seal.

Field Logbook and page number deviation is documented on: 100057 page 132-133

Reason for Deviation:

Another step to insure samples are kept under proper custody until they are received at the laboratory.

Potential Implications of this Deviation:

None

Duration of Deviation (circle one):

Temporary

Date(s):

Resident address(es):

Permanent

(complete Proposed Modification Section)

Proposed Modification to SQAPP (attach additional sheets if necessary; state section and page numbers of SQAPP when applicable):

See attached copy of logbook pages.

Technical Review:

(Volpe Project Manager or designate) does not apply to CSS

Date:

7/19/02

Quality Assurance Review and Approval:

(Quality Assurance Coordinator or designate)

Date:

7/19/02

Approved By:

(USEPA RPM, OSC, or SSC)

Title:

8/20/02 RPM

2
Date 7-15-02

Libby m
Libby m

Project / Client
Libby Asbestos Site
Volpe Center EPA Region 8

0715 Review paperwork completed 7-13-02
0800 Attend morning meeting
0900 Receive call from Information Center: Rose
Woods @ 1248 Nevada 293-4724
would like to schedule an appointment.
Infor Shawn Oliveira (Area #3)
1000 Receive call from Angela Frandsen
regarding Mod form need for not using
Alconox as part of decon.
1027 Prepare modification form #0000434
Alconox detergent w/riser is not being used
as part of the decontamination procedures.
Modification To SAP: Site Specific SOP for
Soil Sample Collection page 6, first
paragraph: "Washing should be
performed by use of deionized water."
1050 Return call 7-15-02 Fax Mbo form 000044
to Angela Frandsen and George Delullo
1052 Relinquish Mod form #000044 to Terry
Keller.
1055 Prepare Mod form #000045 - sampler
will be shipped in cooler lined with trash
bag, and trash bag will be sealed.
Modification To SAP: page 5 to Section
5.4.6

Libby m
Libby m

Project / Client
Libby Asbestos Site
Volpe Center EPA Region 8

5.4.6 Sample Packaging and Shipping -
Delect modification to Section 1.5.
Procedures.
1100 Fax Mod #000045 to Angela
Frandsen and George Delullo
1107 E-mail Jeff Montero with modifications
documented in Mod forms 414 and 415.

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Prepared: Krista Lippoldt

Technical Review: Brian Jenks

QA Review: David O. Johnson

Approved: [Signature]

Signature/Date

Issued: [Signature]

Signature/Date

1.0 PACKAGING AND SHIPPING OF ALL SAMPLES – This standard operating procedure (SOP) applies to the packaging and shipping of all environmental samples. If the sample is preserved or radioactive, the following sections may also be applicable.

Section 2.0 – Packaging and Shipping of Samples Preserved with Hexane

Section 3.0 – Packaging and Shipping of Samples Preserved with Sodium Hydroxide

Section 4.0 – Packaging and Shipping of Samples Preserved with Hydrochloric Acid

Section 5.0 – Packaging and Shipping of Samples Preserved with Nitric Acid

Section 6.0 – Packaging and Shipping of Samples Preserved with Sulfuric Acid

Section 7.0 – Packaging and Shipping of Limited Quantity Radioactive Samples

1.1 OBJECTIVE

The objective of this SOP is to outline the requirements for the packaging and shipment of environmental samples.

1.2 BACKGROUND

1.2.1 Definitions

Environmental Sample – An environmental sample is any sample that has less than reportable quantities for any hazardous constituents according to Department of Transportation (DOT) regulations promulgated in 49 CFR - Part 172.

Custody Seal – A custody seal is a narrow adhesive-backed seal that is applied to individual sample containers and/or the sample shipping container (i.e. cooler) before offsite shipment. Custody seals are used as a protective mechanism to ensure that sample integrity is not compromised during transportation from the field to the analytical laboratory.

Secondary Containment – A secondary containment is the container that the sample is shipped in (i.e., plastic overpackaging if liquid sample is collected in glass).

Exempted Quantity – Exempted quantity is the amount of hazardous material that does not fall under DOT/IATA/ICAO regulations. This exemption is very difficult to meet; most shipments will be made under limited quantity.

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Limited Quantity – Limited quantity is the maximum amount of a hazardous material for which there is a specific labeling or packaging exception.

Performance Testing – Performance testing is the required testing of outer packaging. These tests include the drop and stacking test.

Qualified Shipper – A qualified shipper is a person who has been adequately trained to perform the functions of shipping hazardous materials.

1.2.2 Discussion

Proper packaging and shipping is necessary to ensure the protection of the integrity of environmental samples shipped for analysis.

1.2.3 Associated Procedure

- CDM Federal SOP 1-2, Sample Custody

1.3 RESPONSIBILITIES

Field Team Leader (FTL) - The field team leader is responsible for ensuring that packaging and sampling procedures are conducted in accordance with this SOP. The field team leader is also responsible for ensuring that CDM Federal properly coordinates laboratory analysis of samples.

1.4 REQUIRED EQUIPMENT

- Coolers with return address of CDM Federal office
- Heavy-duty plastic garbage bags
- Plastic Ziploc®-type bags, small and large
- Clear tape
- Fiber tape – nylon reinforced strapping tape
- Duct tape
- Vermiculite (or equivalent)*
- Bubble wrap (optional)
- Ice
- Custody seals
- Completed chain-of-custody record or CLP custody records, if applicable
- Completed bill of lading
- "This End Up" and directional arrow labels

* Check for any client-specific or laboratory requirements related to the use of absorbent packaging materials.

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1.5 PROCEDURES

The following steps must be followed when packing sample bottles and jars for shipment:

1. Verify the samples undergoing shipment meet the definition of "Environmental Sample" and are not a hazardous material as defined by DOT. Professional judgment and/or consultation with the appropriate health and safety coordinator or the health and safety manager should be observed.
2. Select a sturdy cooler in good repair. Secure and tape the drain plug with fiber or duct tape. Line the cooler with a large heavy-duty plastic garbage bag.
3. Be sure the caps on all bottles are tight (will not leak); check to see that labels and chain-of-custody records are completed properly (SOP 1-2, Sample Custody).
4. Place all bottles in separate and appropriately sized plastic zip-top bags and close the bags. Up to three VOA vials may be packed in one bag. Bottles may be wrapped in bubble wrap. Optionally, place three to six VOA vials in a quart metal can and then fill the can with vermiculite or equivalent. Note: Trip blanks must be included in coolers containing VOA samples.
5. Place 2 to 4 inches of vermiculite (or equivalent) into a cooler that has been lined with a garbage bag, and then place the bottles and cans in the bag with sufficient space to allow for the addition of more packing material between the bottles and cans. It is preferable to place glass sample bottles and jars into the cooler vertically. Due to the strength properties of a glass container, there is much less chance for breakage when the container is packed vertically rather than horizontally.
6. Put ice in large plastic zip-top bags (double bagging the zip-tops is preferred) and properly seal. Place the ice bags on top of and/or between the samples. Several bags of ice are required (dependant on outdoor temperature, staging time, etc.) to maintain the cooler temperature at approximately 4° centigrade. Fill all remaining space between the bottles or cans with packing material. Securely fasten the top of the large garbage bag with fiber or duct tape.
7. Place the completed chain-of-custody record or the CLP traffic report form (if applicable) for the laboratory into a plastic zip-top bag, seal the bag, tape the bag to the inner side of the cooler lid and close the cooler.
8. The cooler lid shall be secured with nylon reinforced strapping tape by wrapping each end of the cooler a minimum of two times. Attach a completed chain-of-custody seal across the hinges of the cooler on opposite sides. The custody seals should be affixed to the cooler with half of the seal on the strapping tape so that the cooler cannot be opened without breaking the seal. Complete two more wraps around with fiber tape and place clear tape over the custody seals.

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9. The shipping container lid must be marked "THIS END UP" and arrow labels that indicate the proper upward position of the container should be affixed to the cooler. A label containing the name and address of the shipper (CDM Federal) shall be placed on the outside of the container. Labels used in the shipment of hazardous materials (such as Cargo Only Air Craft, Flammable Solids, etc.) are not permitted on the outside of containers used to transport environmental samples and shall not be used. The name and address of the laboratory shall be placed on the container, or when shipping by common courier, the bill of lading shall be completed and attached to the lid of the shipping container.

1.6 RESTRICTIONS/LIMITATIONS

The holding times for the samples packed for shipment must not be exceeded. It is recommended that samples be packed in time to be shipped nightly for overnight delivery. Use caution when shipping samples for weekend delivery; make arrangements with the laboratory before sending samples.

2.0 PACKAGING AND SHIPPING OF SAMPLES PRESERVED WITH HEXANE

2.1 OBJECTIVE

This section provides guidance for the shipment of soil and water environmental samples regulated under the DOT Hazardous Materials Regulations and the IATA/ICAO Dangerous Goods Regulations for shipment by air and applies only to domestic shipments.

2.2 BACKGROUND

2.2.1 Definitions

Section 1.2.1 defines the terms relevant to this section.

2.2.2 Transportation

This section was prepared for the shipment of hexane-preserved samples.

2.2.3 Containers

- 40 ml glass VOA vials (up to 1L per outer package)

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2.3 RESPONSIBILITY

It is the responsibility of the qualified shipper to ensure that each shipment contains no more than the maximum of 24 VOA vials for a total liquid volume of 1 liter and that the shipment is packaged according to IATA/ICAO packaging instruction Y305 for limited quantities of hexane.

REQUIRED EQUIPMENT

- Outer packaging (for limited quantities) insulated cooler that has passed the performance test
- Garbage bags
- Clear tape
- Duct tape
- Strapping tape (optional)
- Ziploc®-type bags, small and large
- Vermiculite (or equivalent)*
- Bubble wrap
- Ice
- Chain-of-custody seals
- Chain-of-custody form
- Survey documentation (if shipping from Department of Energy [DOE] or radiological sites)
- Class 3 flammable liquid labels
- Orientation labels
- Consignor/consignee labels

* Check for any client-specific or laboratory requirements related to the use of absorbent packaging materials.

2.5 PACKAGING

The following steps are to be followed when packaging limited quantity samples shipments.

- Tape any interior opening in the cooler (drain plug) from the inside to ensure control of interior contents. Also, tape the drain plug from the outside of the cooler.
- All sample containers will be properly labeled and the label protected with waterproof tape prior to sampling.
- At a minimum the label must contain:
 - Project name
 - Project number
 - Date and time of sample collection
 - Sample location
 - Sample identification number
 - Collector's initials

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- Preservative (note amount of preservative used in miscellaneous section of the chain-of-custody)
- Wrap each container (40 ml VOA vials) in bubble wrap (secure with waterproof tape) to prevent breakage.
- Place the bubble wrapped container into a 2.7 mil Ziploc®-type bag, removing trapped air.
- Place wrapped containers inside a polyethylene bottle filled with vermiculite; seal the bottle. (Maximum of 4 VOA vials will fit inside a 500-ml wide-mouth polyethylene bottle.)
- Place sufficient amount of vermiculite in the bottom of the cooler to absorb any leakage that may occur.
- Place a garbage bag in the cooler.
- Pack the samples appropriately inside the garbage bag (bottles placed upright) to prevent movement during shipment.
- Place a sufficient amount of double-bagged ice around the samples to maintain the required temperature during shipment.
- Seal the garbage bag by tying or taping.
- The maximum weight of the cooler shall not exceed 30 kg (66 lbs) for any limited quantity shipment of dangerous goods.
- Secure the chain-of-custody form (placed inside a Ziploc®-type bag) to the interior of the cooler lid.
- If the shipment is from a DOE or other facility, place the results of the radiation screen and cooler/sample survey with the chain-of-custody.
- Wrap strapping tape or duct tape around both ends of the cooler and around the cooler lid.
- Affix custody seals to opposite sides of the cooler lid. Cover the custody seals with clear waterproof tape.
- Mark the outside of the cooler with the proper shipping name of the contents, corresponding UN number, and LTD. QTY. (as shown below).

HEXANES MIXTURE

UN1208

LTD. QTY.

- Place a label on the front of the cooler with the company name, contact name, phone number, full street address, and state with zip code for both shipper and recipient.
- Affix a Flammable Liquid label to the outside of the cooler.
- Affix package orientation labels on two opposite sides of the cooler.
- Secure the marking and labels to the surface of the cooler with clear waterproof tape to prevent accidental removal during shipment.
- An example of cooler labeling/marketing locations is shown in Figure 1.

NOTE: No marking or labeling can be obscured by strapping or duct tape.

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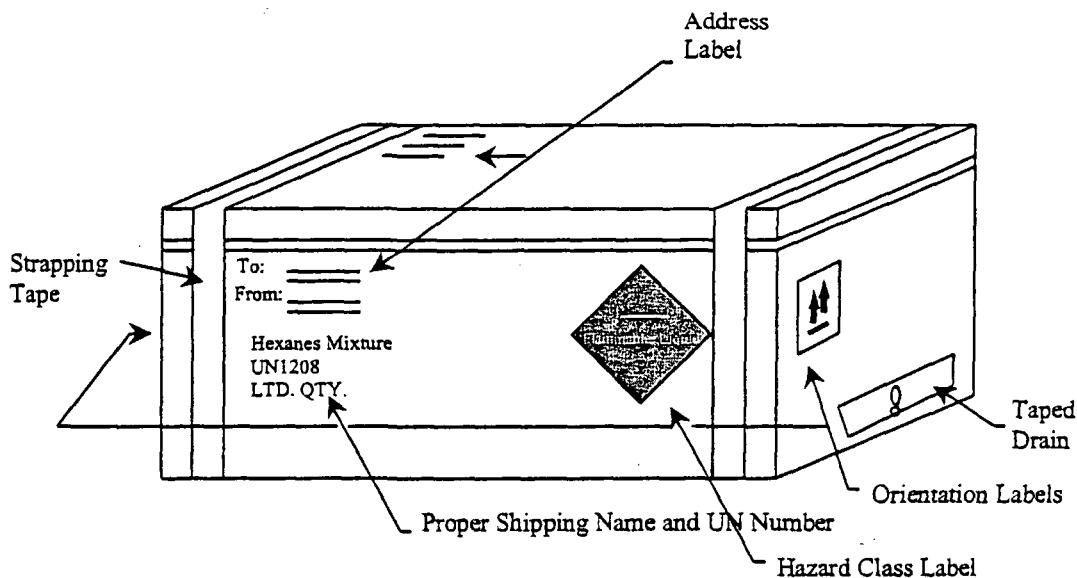
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NOTE: The inner packaging of dangerous goods may be placed into the designated cooler for shipment. Other non-regulated environmental samples may be added to the cooler for shipment.

- When shipping from a DOE facility, the cooler will be surveyed by a qualified radiation control technician to ensure the exterior surfaces do not exceed 0.5 mrem/h on all sides. This survey will be documented and the results reviewed by the qualified shipper.
- Complete the Dangerous Goods and Hazardous Materials Inspection Checklist for Shipping Limited Quantity (Appendix A).
- Complete a Dangerous Goods Airbill.

Figure 1 Example of Cooler Label/Marking Locations



3.0 PACKAGING AND SHIPPING OF SAMPLES PRESERVED WITH SODIUM HYDROXIDE

3.1 OBJECTIVE

This section provides guidance for the shipment of soil and water environmental samples regulated under the DOT Hazardous Materials Regulations and the IATA/ICAO Dangerous Goods Regulations for shipment by air and applies only to domestic shipments.

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3.2 BACKGROUND

3.2.1 Definitions

Section 1.2.1 defines the terms relevant to this section.

3.2.2 Transportation

This section was prepared for the shipment of sodium hydroxide (NaOH) preserved samples.

3.2.3 Containers

The inner packaging container (and amount of preservative) that may be used for these shipments includes:

Exempted Quantities of Preservatives

Preservative		Desired in Final Sample		Quantity of Preservative (ml) for Specified Container				
		pH	Conc.	40 ml	125 ml	250 ml	500 ml	1 L
NaOH	30%	>12	0.08%		.25	0.5	1	2

5 drops = 1 ml

3.3 RESPONSIBILITY

It is the responsibility of the qualified shipper to determine the amount of preservative in each sample so that accurate determination of quantities can be made.

REQUIRED EQUIPMENT

- Outer packaging (for limited quantities) insulated cooler that has passed the performance test.
- Garbage bags
- Clear tape
- Duct tape
- Strapping tape (optional)
- Ziploc®-type bags, small and large
- Vermiculite (or equivalent)*
- Bubble wrap (optional)
- Ice
- Custody seals
- Chain-of-custody form

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- Survey documentation (if shipping from Department of Energy [DOE] or radiological sites)
- Class 8 corrosive labels
- Orientation labels
- Consignor/consignee labels

* Check for any client-specific or laboratory requirements related to the use of absorbent packaging materials.

3.5 PACKAGING

Samples containing NaOH as a preservative that exceed the exempted concentration of 0.08 percent (2 ml of a 30 percent per liter) will be shipped as a limited quantity per packing instruction Y809 of the IATA/ICAO Dangerous Goods Regulations.

The following steps are to be followed when packaging limited quantity samples shipments.

- Tape any interior opening in the cooler (drain plug) from the inside to ensure control of interior contents. Also, tape the drain plug from the outside of the cooler.
- All sample containers will be properly labeled and the label protected with waterproof tape prior to sampling.
- At a minimum the label must contain:
 - Project name
 - Project number
 - Date and time of sample collection
 - Sample location
 - Sample identification number
 - Collector's initials
 - Preservative (note amount of preservative used in miscellaneous section of the chain-of-custody)
- This step is optional; wrap each container in bubble wrap (secure with waterproof tape) to prevent breakage.
- Place the bubble wrapped container into a 2.7 mil Ziploc®-type bag, removing trapped air.
- Place glass containers inside a polyethylene bottle filled with vermiculite; seal the bottle.
- Place sufficient amount of vermiculite in the bottom of the cooler to absorb any leakage that may occur.
- Place a garbage bag in the cooler.
- Pack the samples appropriately inside the garbage bag (bottles placed upright) to prevent movement during shipment.
- Place a sufficient amount of double-bagged ice around the samples to maintain the required temperature during shipment.
- Seal the garbage bag by tying or taping.
- The maximum weight of the cooler shall not exceed 30 kg (66 lbs) for any limited quantity shipment of dangerous goods.

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- Secure the chain-of-custody form (placed inside a Ziploc®-type bag) to the interior of the cooler lid.
- If the shipment is from a DOE or other facility, place the results of the radiation screen and cooler/sample survey with the chain-of-custody.
- Wrap strapping tape or duct tape around both ends of the cooler and around the cooler lid.
- Affix custody seals to opposite sides of the cooler lid. Cover the custody seals with clear waterproof tape.
- Mark the outside of the cooler with the proper shipping name of the contents, corresponding UN number, and LTD. QTY. (as shown below).

SODIUM HYDROXIDE SOLUTION
UN1824
LTD. QTY.

- Place a label on the front of the cooler with the company name, contact name, phone number, full street address, and state with zip code for both shipper and recipient.
- Affix a Corrosive label to the outside of the cooler.
- Affix package orientation labels on two opposite sides of the cooler.
- Secure the marking and labels to the surface of the cooler with clear waterproof tape to prevent accidental removal during shipment.
- An example of cooler labeling/marketing locations is shown in Figure 1.

NOTE: Samples meeting the exemption concentration of 0.08 percent NaOH by weight will be shipped as non-regulated or non-hazardous.

NOTE: No marking or labeling can be obscured by strapping or duct tape.

NOTE: The inner packaging of dangerous goods may be placed into the designated cooler for shipment. Other non-regulated environmental samples may be added to the cooler for shipment.

- When shipping from a DOE facility, the cooler will be surveyed by a qualified radiation control technician to ensure the exterior surfaces do not exceed 0.5 mrem/h on all sides. This survey will be documented and the results reviewed by the qualified shipper.
- Complete the Dangerous Goods and Hazardous Materials Inspection Checklist for Shipping Limited Quantity (Appendix A).
- Complete a Dangerous Goods Airbill.

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4.0 PACKAGING AND SHIPPING OF SAMPLES PRESERVED WITH HYDROCHLORIC ACID

4.1 OBJECTIVE

This section provides guidance for the shipment of soil and water environmental samples regulated under the DOT Hazardous Materials Regulations and the IATA/ICAO Dangerous Goods Regulations for shipment by air and applies only to domestic shipments.

4.2 BACKGROUND

4.2.1 Definitions

Section 1.2.1 defines the terms relevant to this section.

4.2.2 Transportation

This section was prepared for the shipment of hydrochloric acid (HCl) preserved samples.

4.2.3 Containers

The inner packaging container (and amount of preservative) that may be used for these shipments includes:

Exempted quantities of preservatives

Preservative		Desired in Final Sample		Quantity of Preservative (ml) for Specified Container				
				pH	Conc.	40 ml	125 ml	250 ml
HCl	2N	<2	0.04%	.2	.5	1		

5 drops = 1 ml

4.3 RESPONSIBILITY

It is the responsibility of the qualified shipper to determine the amount of preservative in each sample so that accurate determination of quantities can be made.

4.4 REQUIRED EQUIPMENT

- Outer packaging (for limited quantities) insulated cooler that has passed the performance test.
- Garbage bags
- Clear tape

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- Duct tape
- Strapping tape (optional)
- Ziploc®-type bags, small and large
- Vermiculite (or equivalent)*
- Bubble wrap
- Ice
- Custody seals
- Chain-of-custody form
- Survey documentation (if shipping from Department of Energy [DOE] or radiological sites)
- Class 8 corrosive labels
- Orientation labels
- Consignor/consignee labels

* Check for any client-specific or laboratory requirements related to the use of absorbent packaging materials.

4.5 PACKAGING

The following steps are to be followed when packaging limited quantity samples shipments.

- Tape any interior opening in the cooler (drain plug) from the inside to ensure control of interior contents. Also, tape the drain plug from the outside of the cooler.
- All sample containers will be properly labeled and the label protected with waterproof tape prior to sampling.
- At a minimum the label must contain:
 - Project name
 - Project number
 - Date and time of sample collection
 - Sample location
 - Sample identification number
 - Collector's initials
 - Preservative (note amount of preservative used in miscellaneous section of the chain-of-custody)
- Wrap each container (40 ml VOA vials) in bubble wrap (secure with waterproof tape) to prevent breakage.
- Place the bubble wrapped container into a 2.7 mil Ziploc®-type bag, removing trapped air.
- Place wrapped containers inside a polyethylene bottle filled with vermiculite; seal the bottle. (Maximum of 4 VOA vials will fit inside a 500-ml wide-mouth polyethylene bottle.)
- Place sufficient amount of vermiculite in the bottom of the cooler to absorb any leakage that may occur.
- Place a garbage bag in the cooler.

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- Pack the samples appropriately inside the garbage bag (bottles placed upright) to prevent movement during shipment.
- Place a sufficient amount of double-bagged ice around the samples to maintain the required temperature during shipment.
- Seal the garbage bag by tying or taping.
- The maximum weight of the cooler shall not exceed 30 kg (66 lbs) for any limited quantity shipment of dangerous goods.
- Secure the chain-of-custody form (placed inside a Ziploc®-type bag) to the interior of the cooler lid.
- If the shipment is from a DOE or other facility, place the results of the radiation screen and cooler/sample survey with the chain-of-custody.
- Wrap strapping tape or duct tape around both ends of the cooler and around the cooler lid.
- Affix custody seals to opposite sides of the cooler lid. Cover the custody seals with clear waterproof tape.
- Mark the outside of the cooler with the proper shipping name of the contents, corresponding UN number, and LTD. QTY. (as shown below).

HYDROCHLORIC ACID SOLUTION UN1789 LTD. QTY.

- Place a label on the front of the cooler with the company name, contact name, phone number, full street address, and state with zip code for both shipper and recipient.
- Affix a Corrosive label to the outside of the cooler.
- Affix package orientation labels on two opposite sides of the cooler.
- Secure the marking and labels to the surface of the cooler with clear waterproof tape to prevent accidental removal during shipment.
- An example of cooler labeling/marketing locations is shown in Figure 1.

NOTE: Samples meeting the exemption concentration of 0.04 percent HCl by weight will be shipped as non-regulated or non-hazardous.

NOTE: No marking or labeling can be obscured by strapping or duct tape.

NOTE: The inner packaging of dangerous goods may be placed into the designated cooler for shipment. Other non-regulated environmental samples may be added to the cooler for shipment.

- When shipping from a DOE facility, the cooler will be surveyed by a qualified radiation control technician to ensure the exterior surfaces do not exceed 0.5 mrem/h on all sides. This survey will be documented and the results reviewed by the qualified shipper.

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- Complete the Dangerous Goods and Hazardous Materials Inspection Checklist for Shipping Limited Quantity (Appendix A).
- Complete a Dangerous Goods Airbill.

5.0 PACKAGING AND SHIPPING OF SAMPLES PRESERVED WITH NITRIC ACID

5.1 OBJECTIVE

This section provides guidance for the shipment of soil and water environmental samples regulated under the DOT Hazardous Materials Regulations and the IATA/ICAO Dangerous Goods Regulations for shipment by air and applies only to domestic shipments.

5.2 BACKGROUND

5.2.1 Definitions

Section 1.2.1 defines the terms relevant to this section.

5.2.2 Transportation

This section was prepared for the shipment of nitric acid (HNO_3) preserved samples.

5.2.3 Containers

The inner packaging container (and amount of preservative) that may be used for these shipments includes:

Exempted quantities of preservatives

Preservative		Desired in Final Sample		Quantity of Preservative (ml) for Specified Container				
		pH	Conc.	40 ml	125 ml	250 ml	500 ml	1 L
HNO_3	6N	<2	0.15%		2	4	5	8

5 drops = 1 ml

5.3 RESPONSIBILITY

It is the responsibility of the qualified shipper to determine the amount of preservative in each sample so that accurate determination of quantities can be made.

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5.4 REQUIRED EQUIPMENT

- Outer packaging (for limited quantities) insulated cooler that has passed the performance test.
- Garbage bags
- Clear tape
- Duct tape
- Strapping tape (optional)
- Ziploc®-type bags, small and large
- Vermiculite (or equivalent)*
- Bubble wrap (optional)
- Ice
- Custody seals
- Chain-of-custody form
- Survey documentation (if shipping from Department of Energy [DOE] or radiological sites)
- Class 8 corrosive labels
- Orientation labels
- Consignor/consignee labels

* Check for any client-specific or laboratory requirements related to the use of absorbent packaging materials.

5.5 PACKAGING

Samples containing HNO_3 as a preservative that exceed the exempted concentration of 0.15% HNO_3 will be shipped as a limited quantity per packing instruction Y807 of the IATA/ICAO Dangerous Goods Regulations.

The following steps are to be followed when packaging limited quantity samples shipments.

- Tape any interior opening in the cooler (drain plug) from the inside to ensure control of interior contents. Also, tape the drain plug from the outside of the cooler.
- All sample containers will be properly labeled and the label protected with waterproof tape prior to sampling.
- At a minimum the label must contain:
 - Project name
 - Project number
 - Date and time of sample collection
 - Sample location
 - Sample identification number
 - Collector's initials
 - Preservative (note amount of preservative used in miscellaneous section of the chain-of-custody)

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- This step is optional; wrap each container in bubble wrap (secure with waterproof tape) to prevent breakage.
- Place the bubble wrapped container into a 2.7 mil Ziploc®-type bag, removing trapped air.
- Place glass containers inside a polyethylene bottle filled with vermiculite; seal the bottle.
- Place sufficient amount of vermiculite in the bottom of the cooler to absorb any leakage that may occur.
- Place a garbage bag in the cooler.
- Pack the samples appropriately inside the garbage bag (bottles placed upright) to prevent movement during shipment.
- Place a sufficient amount of double-bagged ice around the samples to maintain the required temperature during shipment.
- Seal the garbage bag by tying or taping.
- The maximum weight of the cooler shall not exceed 30 kg (66 lbs) for any limited quantity shipment of dangerous goods.
- Secure the chain-of-custody form (placed inside a Ziploc®-type bag) to the interior of the cooler lid.
- If the shipment is from a DOE or other facility, place the results of the radiation screen and cooler/sample survey with the chain-of-custody.
- Wrap strapping tape or duct tape around both ends of the cooler and around the cooler lid.
- Affix custody seals to opposite sides of the cooler lid. Cover the custody seals with clear waterproof tape.
- Mark the outside of the cooler with the proper shipping name of the contents, corresponding UN number, and LTD. QTY. (as shown below).

NITRIC ACID SOLUTION (with less than 20%)
UN2031
LTD. QTY.

- Place a label on the front of the cooler with the company name, contact name, phone number, full street address, and state with zip code for both shipper and recipient.
- Affix a Corrosive label to the outside of the cooler.
- Affix package orientation labels on two opposite sides of the cooler.
- Secure the marking and labels to the surface of the cooler with clear waterproof tape to prevent accidental removal during shipment.
- An example of cooler labeling/marketing locations is shown in Figure 1.

NOTE: Samples meeting the exemption concentration of 0.15 percent HNO_3 by weight will be shipped as non-regulated or non-hazardous.

NOTE: No marking or labeling can be obscured by strapping or duct tape.

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NOTE: The inner packaging of dangerous goods may be placed into the designated cooler for shipment. Other non-regulated environmental samples may be added to the cooler for shipment.

- When shipping from a DOE facility, the cooler will be surveyed by a qualified radiation control technician to ensure the exterior surfaces do not exceed 0.5 mrem/h on all sides. This survey will be documented and the results reviewed by the qualified shipper.
- Complete the Dangerous Goods and Hazardous Materials Inspection Checklist for Shipping Limited Quantity (Appendix A).
- Complete a Dangerous Goods Airbill.

6.0 PACKAGING AND SHIPPING OF SAMPLES PRESERVED WITH SULFURIC ACID

6.1 OBJECTIVE

This section provides guidance for the shipment of soil and water environmental samples regulated under the DOT Hazardous Materials Regulations and the IATA/ICAO Dangerous Goods Regulations for shipment by air and applies only to domestic shipments.

6.2 BACKGROUND

6.2.1 Definitions

Section 1.2.1 defines the terms relevant to this section.

6.2.2 Transportation

This section was prepared for the shipment of sulfuric acid (H_2SO_4) preserved samples.

6.2.3 Containers

The inner packaging container (and amount of preservative) that may be used for these shipments includes:

Exempted quantities of preservatives

Preservative		Desired in Final Sample		Quantity of Preservative (ml) for Specified Container				
				pH	Conc.	40 ml	125 ml	250 ml
H ₂ SO ₄	37N	<2	0.35%	.1	.25	0.5	1	2

5 drops = 1 ml

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6.3 RESPONSIBILITY

It is the responsibility of the qualified shipper to determine the amount of preservative in each sample so that accurate determination of quantities can be made.

6.4 REQUIRED EQUIPMENT

- Outer packaging (for limited quantities) insulated cooler that has passed the performance test.
- Garbage bags
- Clear tape
- Duct tape
- Strapping tape (optional)
- Ziploc®-type bags, small and large
- Vermiculite (or equivalent)*
- Bubble wrap
- Ice
- Custody seals
- Chain-of-custody form
- Survey documentation (if shipping from Department of Energy [DOE] or radiological sites)
- Class 8 corrosive labels
- Orientation labels
- Consignor/consignee labels

* Check for any client-specific or laboratory requirements related to the use of absorbent packaging materials.

6.5 PACKAGING

Samples containing H_2SO_4 as a preservative that exceed the exempted concentration of 0.35 percent will be shipped as a limited quantity per packing instruction Y809 of the IATA/ICAO Dangerous Goods Regulations.

The following steps are to be followed when packaging limited quantity samples shipments.

- Tape any interior opening in the cooler (drain plug) from the inside to ensure control of interior contents. Also, tape the drain plug from the outside of the cooler.
- All sample containers will be properly labeled and the label protected with waterproof tape prior to sampling.
- At a minimum the label must contain:
 - Project name
 - Project number
 - Date and time of sample collection

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- Sample location
- Sample identification number
- Collector's initials
- Preservative (note amount of preservative used in miscellaneous section of the chain-of-custody)
- Wrap each glass container in bubble wrap (secure with waterproof tape) to prevent breakage.
- Place the bubble wrapped container into a 2.7 mil Ziploc®-type bag, removing trapped air.
- Place glass containers inside a polyethylene bottle filled with vermiculite; seal the bottle.
- Place sufficient amount of vermiculite in the bottom of the cooler to absorb any leakage that may occur.
- Place a garbage bag in the cooler.
- Pack the samples appropriately inside the garbage bag (bottles placed upright) to prevent movement during shipment.
- Place a sufficient amount of double-bagged ice around the samples to maintain the required temperature during shipment.
- Seal the garbage bag by tying or taping.
- The maximum weight of the cooler shall not exceed 30 kg (66 lbs) for any limited quantity shipment of dangerous goods.
- Secure the chain-of-custody form (placed inside a Ziploc®-type bag) to the interior of the cooler lid.
- If the shipment is from a DOE or other facility, place the results of the radiation screen and cooler/sample survey with the chain-of-custody.
- Wrap strapping tape or duct tape around both ends of the cooler and around the cooler lid.
- Affix custody seals to opposite sides of the cooler lid. Cover the custody seals with clear waterproof tape.
- Mark the outside of the cooler with the proper shipping name of the contents, corresponding UN number, and LTD. QTY. (as shown below).

SULFURIC ACID SOLUTION

UN2796

LTD. QTY.

- Place a label on the front of the cooler with the company name, contact name, phone number, full street address, and state with zip code for both shipper and recipient.
- Affix a Corrosive label to the outside of the cooler.
- Affix package orientation labels on two opposite sides of the cooler.
- Secure the marking and labels to the surface of the cooler with clear waterproof tape to prevent accidental removal during shipment.
- An example of cooler labeling/marketing locations is shown in Figure 1.

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NOTE: Samples meeting the exemption concentration of 0.35 percent H_2SO_4 by weight will be shipped as non-regulated or non-hazardous.

NOTE: No marking or labeling can be obscured by strapping or duct tape.

NOTE: The inner packaging of dangerous goods may be placed into the designated cooler for shipment. Other non-regulated environmental samples may be added to the cooler for shipment.

- When shipping from a DOE facility, the cooler will be surveyed by a qualified radiation control technician to ensure the exterior surfaces do not exceed 0.5 mrem/h on all sides. This survey will be documented and the results reviewed by the qualified shipper.
- Complete the Dangerous Goods and Hazardous Materials Inspection Checklist for Shipping Limited Quantity (Appendix A).
- Complete a Dangerous Goods Airbill.

7.0 PACKAGING AND SHIPPING OF LIMITED QUANTITY RADIOACTIVE SAMPLES

7.1 OBJECTIVE

This section provides guidance for the shipment of soil and water environmental samples regulated under the DOT Hazardous Materials Regulations and the IATA/ICAO Dangerous Goods Regulations for shipment by air and applies only to domestic shipments.

7.2 BACKGROUND

7.2.1 Definitions

Section 1.2.1 defines the terms relevant to this section.

7.2.2 Transportation

This section was prepared for the shipment of environmental samples containing radioactive materials in limited quantities.

7.2.3 Containers

The inner packaging containers that may be used for these shipments include:

- Any size sample container

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7.3 DESCRIPTION/RESPONSIBILITIES

- The qualified shipper will ship all samples that meet the Class 7 definition of radioactive materials and meet the activity requirements specified in Table 7 of 49 CFR 173.425, as Radioactive Materials in Limited Quantity. The qualified shipper will verify that all packages and their contents meet the requirements of 49 CFR 173.421, "Limited Quantities of Radioactive Materials."
- The packaging used for shipping will meet the general requirements for packaging and packages specified in 49 CFR 173.24 and the general design requirements provided in 173.410. These standards state that a package must be capable of withstanding the effects of any acceleration, vibration, or vibration resonance that may arise under normal condition of transport without any deterioration in the effectiveness of the closing devices on the various receptacles or in the integrity of the package as a whole and without loosening or unintentionally releasing the nuts, bolts, or other securing devices even after repeated use.
- If the shipment is from a Department of Energy (DOE) facility, radiological screenings will be completed on all samples taken. The qualified shipper will review the results of each screening (alpha, beta, and gamma speciation). Samples will not be shipped offsite until the radiological screening has been performed.
- The total activity for each package will not exceed the relevant limits listed in Table 7 of 49 CFR 173.425. The A_2 value of the material will be calculated based on all radionuclides found during previous investigations (if any) in the area from which the samples are derived. The A_2 values to be used will be the most restrictive of all potential radionuclides as listed in 49 CFR 173.435.
- The radiation level at any point on the external surface of the package bearing the sample(s) will not exceed 0.005 mSv/hour (0.5 mrem/hour). These will be verified by dose and activity monitoring prior to shipment of the package.
- The removable radioactive surface contamination on the external surface of the package will not exceed the limits specified in 49 CFR 173.443(a). CDM Federal will use the DOE-established free release criteria for removable surface contamination of less than 20 dpm/100 cm² (alpha) and 1000 dpm/100 cm² (beta/gamma). It should be noted that these values are more conservative than the DOT requirements for removable surface contamination.
- The qualified shipper will verify that the outside of the inner packaging is marked "Radioactive".
- The qualified shipper will verify that the excepted packages prepared for shipment under the provisions of 49 CFR 173.421 have a notice enclosed, or shown on the outside of the package, that reads, "This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, UN2910".

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7.4 REQUIRED EQUIPMENT

- Cooler or other acceptable outer packaging
- Garbage bags
- Clear tape
- Duct tape
- Strapping tape (optional)
- Ziploc®-type bags, small and large
- Vermiculite (for water samples) or equivalent*
- Bubble wrap (optional)
- Ice (if necessary)
- Custody seals
- Chain-of-custody form
- Survey documentation/radiation screening results (if shipping from DOE or radiological sites)
- Orientation labels
- Exempted quantities label
- Consignor/consignee labels

* Check for any client-specific or laboratory requirements related to the use of absorbent packaging materials.

7.5 PACKAGING

The following steps are to be followed when packaging limited quantity samples shipments.

- The cooler is to be surveyed by a qualified radiation control technician to ensure the exterior surfaces do not exceed 0.5 mrem/h on all sides. This survey will be documented and the results reviewed by the qualified shipper.
- Tape any interior opening in the cooler (drain plug) from the inside to ensure control of interior contents. Also, tape the drain plug from the outside of the cooler.
- All sample containers will be properly labeled and the label protected with waterproof tape prior to sampling.
- At a minimum the label must contain:
 - Project name
 - Project number
 - Date and time of sample collection
 - Sample location
 - Sample identification number
 - Collector's initials
- This step is optional; wrap each container in bubble wrap (secure with waterproof tape) to prevent breakage.

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- Place sufficient amount of vermiculite, or approved packaging material, in the bottom of the cooler to absorb any leakage that may occur.
- Place a garbage bag in the cooler.
- Pack the samples appropriately inside the garbage bag (bottles placed upright) to prevent movement during shipment.
- If required, place a sufficient amount of double-bagged ice around the samples to maintain the required temperature during shipment.
- Seal the garbage bag by tying or taping.
- Place a label marked "Radioactive" on the outside of the sealed bag.
- Enclose a notice that includes the name of the consignor or consignee and the following statement: "This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, UN2910.
- The maximum weight of the package shall not exceed 30 kg (66 lbs) for any limited quantity shipment of dangerous goods.
- Secure the chain-of-custody form (placed inside a Ziploc®-type bag) to the interior of the cooler lid.
- If the shipment is from a DOE or other facility, place the results of the radiation screen and cooler/sample survey with the chain-of-custody.
- If a cooler is used, wrap strapping tape or duct tape around both ends of the cooler and around the cooler lid.
- Affix custody seals to opposite sides of the cooler lid. Cover the custody seals with clear waterproof tape.
- Place a label on the front of the cooler with the company name, contact name, phone number, full street address, and state with zip code for both shipper and recipient.
- Affix package orientation labels on two opposite sides of the cooler/package.
- Affix a completed Excepted Quantities label to the side of the cooler/package.
- Secure any marking and labels to the surface of the cooler with clear waterproof tape to prevent accidental removal during shipment.
- An example of the cooler labeling/marketing is shown in Figure 2.

NOTE: No marking or labeling can be obscured by strapping or duct tape.

- Complete the Shipment Quality Assurance Checklist (Appendix B).

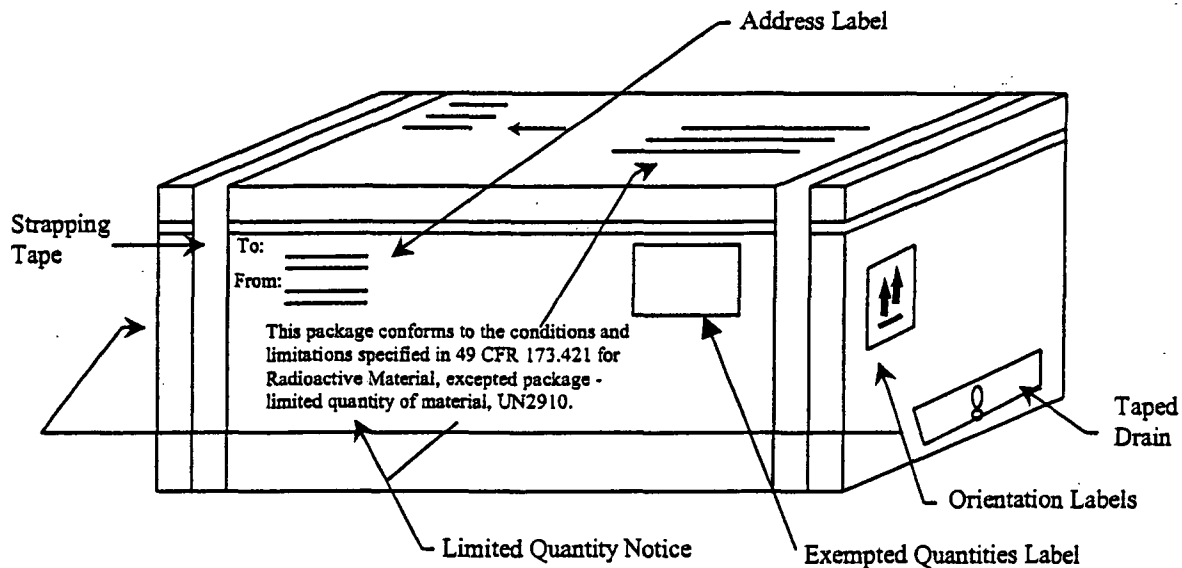
NOTE: Except as provided in 49 CFR 173.426, the package will not contain more than 15 grams of ^{235}U .

NOTE: A declaration of dangerous goods is not required.

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Figure 2 Radioactive Material - Limited Quantity Cooler Marking Example



8.0 REFERENCES

U.S. Environmental Protection Agency, *Sampler's Guide to the Contract Laboratory Program*, EPA/540/P-90/006, December 1990.

U.S. Environmental Protection Agency, Region IV, *Standard Operating Procedures and Quality Assurance Manual*, February 1991.

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APPENDIX A

Dangerous Goods and Hazardous Materials Inspection Checklist for Shipping Limited Quantity

Sample Packaging

Yes No N/A

☐ ☐ ☐

The VOA vials are wrapped in bubble wrap and placed inside a Ziploc®-type bag.

☐ ☐ ☐

The VOA vials are placed into a polyethylene bottle, filled with vermiculite, and tightly sealed.

☐ ☐ ☐

The drain plug is taped inside and outside to ensure control of interior contents.

☐ ☐ ☐

The samples have been placed inside garbage bags with sufficient bags of ice to preserve samples at 4°C.

☐ ☐ ☐

The cooler exceeds the 66-pound limit for limited quantity shipment.

☐ ☐ ☐

The garbage bag has been sealed with tape (or tied) to prevent movement during shipment.

☐ ☐ ☐

The chain-of-custody has been secured to the interior of the cooler lid.

☐ ☐ ☐

The cooler lid and sides have been taped to ensure a seal.

☐ ☐ ☐

The custody seals have been placed on both the front and back hinges of the cooler, using waterproof tape.

Air Waybill Completion

Yes No N/A

☐ ☐ ☐

Section 1 has the shipper's name, company and address; the account number, date, internal billing reference number; and the telephone number where the shipper can be reached.

☐ ☐ ☐

Section 2 has the recipient's name and company along with a telephone number where they can be reached.

☐ ☐ ☐

Section 3 has the **Bill Sender** box checked.

☐ ☐ ☐

Section 4 has the **Standard Overnight** box checked.

☐ ☐ ☐

Section 5 has the **Deliver Weekday** box checked.

☐ ☐ ☐

Section 6 has the number of packages and their weights filled out. Was the total of all packages and their weights figured up and added at the bottom of Section 6?

☐ ☐ ☐

Under the **Transport Details** box, the **Cargo Aircraft Only** box is obliterated, leaving only the **Passenger and Cargo Aircraft** box.

☐ ☐ ☐

Under the **Shipment Type**, the **Radioactive** box is obliterated, leaving only the **Non-Radioactive** box.

☐ ☐ ☐

Under the **Nature and Quantity of Dangerous Goods** box, the **Proper Shipping Name, Class or Division, UN or ID No., Packing Group, Subsidiary Risk, Quantity and Type of Packing, Packing Instructions and Authorization** have been filled out for the type of chemical being sent.

☐ ☐ ☐

The **Name, Place & Date, Signature, and Emergency Telephone number** appears at the bottom of the FedEx Airbill.

☐ ☐ ☐

The statement "In accordance with IATA/ICAO" appears in the **Additional Handling Information** box.

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Proper Shipping Name	Class or Division	UN or ID No.	Packing Group	Sub Risk	Quantity	Packing Instruction	Authorization
Hydrochloric Acid Solution	8	UN1789	II		1 plastic box x 0.5 L	Y809	LTD QTY
Nitric Acid Solution (with less than 20%)	8	UN2031	II		1 plastic box x 0.5 L	Y807	LTD QTY
Sodium Hydroxide Solution	8	UN1824	II		1 plastic box x 0.5 L	Y809	LTD QTY
Sulfuric Acid Solution	8	UN2796	II		1 plastic box x 0.5 L	Y809	LTD QTY
Hexanes	3	UN1208	II		1 plastic box x 1 L	Y305	LTD QTY

Sample Cooler Labeling

Yes No N/A

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The proper shipping name, UN number, and LTD. QTY. appears on the shipping container. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The corresponding hazard labels are affixed on the shipping container; the labels are not obscured by tape. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The name and address of the shipper and receiver appear on the top and side of the shipping container. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The air waybill is attached to the top of the shipping container. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Up Arrows have been attached to opposite sides of the shipping container. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Packaging tape does not obscure markings or labeling. |

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ENVIRONMENTAL SAMPLES**

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**APPENDIX B
SHIPMENT QUALITY ASSURANCE CHECKLIST**

Date: _____ Shipper: _____ Destination: _____

Item(s) Description: _____

Radionuclide(s): _____

Radiological Survey Results: surface _____ mrem/hr 1 meter _____

Instrument Used: Mfgr: _____ Model: _____

S/N: _____ Cal Date: _____

LIMITED QUANTITY OR INSTRUMENT AND ARTICLE

- | Yes | No | |
|-----|-----|--|
| ___ | ___ | 1. Strong tight package (package that will not leak material during conditions normally incidental to transportation). |
| ___ | ___ | 2. Radiation levels at any point on the external surface of package less than or equal to 0.5 mrem/hr. |
| ___ | ___ | 3. Removable surface contamination less than 20 dpm/100 cm ² (alpha) and 1000 dpm/100 cm ² (beta/gamma). |
| ___ | ___ | 4. Outside inner package bears the marking "Radioactive". |
| ___ | ___ | 5. Package contains less than 15 grams of ²³⁵ U (check yes if ²³⁵ U not present). |
| ___ | ___ | 6. Notice enclosed in or on the package that includes the consignor or consignee and the statement, "This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, UN2910." |
| ___ | ___ | 7. Activity less than that specified in 49 CFR 173.425. Permissible package limit:
Package Quantity: _____ |
| ___ | ___ | 8. On all air shipments, the statement, Radioactive Material, excepted package-limited quantity of material shall be noted on the air waybill. |

Qualified Shipper: _____ Signature: _____

Appendix E

CDM SOP 1-2

Sample Custody

SAMPLE CUSTODY

SOP 1-2

Revision: 3

Date October 12, 2001

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Prepared: David O. Johnson

Technical Review: Jackie Mosher

QA Review: Doug Updike

Approved: [Signature]

Issued: Rose Mary Gustin 10/12/01
Signature/Date

Signature/Date

1.0 OBJECTIVE

Due to the evidentiary nature of samples collected during environmental investigations, possession must be traceable from the time the samples are collected until their derived data are introduced as evidence in legal proceedings. To maintain and document sample possession, sample custody procedures are followed. All paperwork associated with the sample custody procedures will be retained in CDM Federal Programs Corporation (CDM Federal) files unless the client requests that it be transferred to them for use in legal proceedings or at the completion of the contract.

Note: Sample custody documentation requirements vary with the specific EPA region or client. This SOP is intended to present basic sample custody requirements, along with common options. Specific sample custody requirements should be presented in the project-specific quality assurance (QA) project plan or project-specific modification or clarification form (See Section U-1).

2.0 BACKGROUND

2.1 Definitions

Sample – A sample is material to be analyzed that is contained in single or multiple containers representing a unique sample identification number.

Sample Custody – A sample is under custody if:

1. It is in your possession.
2. It is in your view, after being in your possession.
3. It was in your possession and you locked it up.
4. It is in a designated secure area.

Chain-of-Custody Record – A chain-of-custody record is a form used to document the transfer of custody of samples from one individual to another.

Custody Seal – A custody seal is a tape-like seal that is part of the chain-of-custody process and is used to detect tampering with samples after they have been packed for shipping.

SAMPLE CUSTODY

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Sample Label – A sample label is an adhesive label placed on sample containers to designate a sample identification number and other sampling information.

Sample Tag – A sample tag is attached with string to a sample container to designate a sample identification number and other sampling information. Tags may be used when it is difficult to physically place adhesive labels on the container (e.g., in the case of small air sampling tubes).

3.0 RESPONSIBILITIES

Sampler – The sampler is personally responsible for the care and custody of the samples collected until they are properly transferred or dispatched.

Field Team Leader (FTL) – The FTL is responsible for ensuring that strict chain-of-custody procedures are maintained during all sampling events. The FTL is also responsible for coordinating with the subcontractor laboratory to ensure that adequate information is recorded on custody records. The FTL determines whether proper custody procedures were followed during the fieldwork and decides if additional samples are required.

Field Sample Custodian – The field sample custodian, when designated by the FTL, is responsible for accepting custody of samples from the sampler(s) and properly packing and shipping the samples to the laboratory assigned to do the analyses. A field sample custodian is typically designated only for large and complex field efforts.

4.0 REQUIRED SUPPLIES

- Chain-of-custody records (applicable client or CDM Federal forms)
- Custody seals
- Sample labels or tags
- Clear tape

5.0 PROCEDURES

5.1 Chain-of-Custody Record

This procedure establishes a method for maintaining custody of samples through use of a chain-of-custody record. This procedure will be followed for all samples collected or split samples accepted.

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Field Custody

1. Collect only the number of samples needed to represent the media being sampled. To the extent possible, determine the quantity and types of samples and sample locations prior to the actual fieldwork. As few people as possible should handle samples.
2. Complete sample labels or tags for each sample, using waterproof ink.

Transfer of Custody and Shipment

1. Complete a chain-of-custody record for all samples (see Figure 1 for an example of a chain-of-custody record. Similar forms may be used when requested by the client). When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents sample custody transfer from the sampler, often through another person, to the sample custodian in the appropriate laboratory.
 - The date/time will be the same for both signatures when custody is transferred directly to another person. When samples are shipped via common carrier (e.g., Federal Express), the date/time will not be the same for both signatures. Common carriers are not required to sign the chain-of-custody record.
 - In all cases, it must be readily apparent that the person who received custody is the same person who relinquished custody to the next custodian.
 - If samples are left unattended or a person refuses to sign, this must be documented and explained on the chain-of-custody record.

NOTE: If a field sample custodian has been designated, he/she may initiate the chain-of-custody record, sign and date as the relinquisher. The individual sampler(s) must sign in the appropriate block, but does (do) not need to sign and date as a relinquisher (refer to Figure 1).

2. Package samples properly for shipment and dispatch to the appropriate laboratory for analysis. Each shipment must be accompanied with a separate chain-of-custody record.
3. Include a chain-of-custody record identifying its content in all shipments (refer to Figure 1). The original record will accompany the shipment, and the copies will be retained by the FTL and, if applicable, distributed to the appropriate sample coordinators. Freight bills will also be retained by the FTL as part of the permanent documentation.

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Figure 1
EXAMPLE CDM Federal Chain-of-Custody Record

CDM Federal Programs Corporation
A subsidiary of Camp Dresser & McKee Inc.

125 Malden Lane, 5th Floor
New York, NY 10038
(212) 785-9123
Fax: (212) 785-6114

CHAIN OF CUSTODY RECORD

PROJECT ID.		FIELD TEAM LEADER		LABORATORY AND ADDRESS				DATE SHIPPED			
PROJECT NAME/LOCATION				LAB CONTRACT:				AIRBILL NO.			
MEDIA TYPE		PRESERVATIVES		SAMPLE TYPE		ANALYSES (List no. of containers submitted)					
1. Surface Water 2. Groundwater 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil 7. Waste 8. Other _____		1. HCl, pH <2 2. HNO ₃ , pH <2 3. NaOH, pH >12 4. H ₂ SO ₄ , pH <2 5. Zinc Acetate, pH >9 6. Ice Only 7. Not Preserved 8. Other _____		G = Grab C = Composite							
SAMPLE LOCATION NO.	LABORATORY SAMPLE NUMBER	PRESERVATIVES ADDED	MEDIA TYPE	SAMPLE TYPE	IS DATE	TIME SAMPLED					REMARKS (Note if MS/MSD)
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											

SAMPLER SIGNATURES:							
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME
(PRINT)		(PRINT)		(PRINT)		(PRINT)	
(SIGN)		(SIGN)		(SIGN)		(SIGN)	
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME
(PRINT)		(PRINT)		(PRINT)		(PRINT)	
(SIGN)		(SIGN)		(SIGN)		(SIGN)	

COMMENTS:

DISTRIBUTION: White and yellow copies accompany sample shipment to laboratory; yellow copy retained by laboratory. Pink copy retained by samplers.

1/98

NOTE: If requested by the client, different chain-of-custody records may be used. Copies of the template for this record may be obtained from the Fairfax Graphics Department.

SAMPLE CUSTODY

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Procedure for Completing CDM Federal Example Chain-of-Custody Record (Refer to Figure 1.)

The following procedure is to be used to fill out the CDM Federal chain-of-custody record. The record is provided herein as an example chain-of-custody record. If another type of custody record (i.e., provided by the EPA contract laboratory program or a subcontract laboratory) is used to track the custody of samples, the custody record should be filled out in its entirety.

1. Record project number.
2. Record FTL for the project (if a field sample custodian has been designated, also record this name in the "Remarks" box).
3. Record the name and address of the laboratory to which samples are being shipped.
4. Enter the project name/location or code number.
5. Record overnight courier's airbill number.
6. Record sample location number.
7. Record sample number.
8. Note preservatives type and reference number.
9. Note media type (matrix) and reference number.
10. Note sample type.
11. Enter date of sample collection.
12. Enter time of sample collection in military time.
13. When required by the client, enter the names or initials of the samplers next to the sample location number of the sample they collected.
14. List parameters for analysis and the number of containers submitted for each analysis.
15. Enter MS/MSD (matrix spike/matrix spike duplicate) if sample is for laboratory quality control or other remarks (e.g. sample depth).
16. Sign the chain-of-custody record(s) in the space provided. All samplers must sign each record.
17. If sample tags are used, record the sample tag number in the "Remarks" column.
18. Record date shipped.
19. The originator checks information entered in Items 1 through 16 and then signs the top left "Relinquished by" box, prints his/her name, and enters the current date and time (military).

SAMPLE CUSTODY

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20. Send the top two copies (usually white and yellow) with the samples to the laboratory; retain the third copy (usually pink) for the project files. Retain additional copies for the project file or distribute as required to the appropriate sample coordinators.
21. The laboratory sample custodian receiving the sample shipment checks the sample label information against the chain-of-custody record. Sample condition is checked and anything unusual is noted under "Remarks" on the chain-of-custody record. The laboratory custodian receiving custody signs in the adjacent "Received by" box and keeps the copy. The white copy is returned to CDM Federal.

5.2 Sample Labels and Tags

Unless the client directs otherwise, sample labels or tags will be used for all samples collected or accepted for CDM Federal projects.

1. Complete one label or tag with the information required by the client for each sample container collected. A typical label or tag would be completed as follows (see Figure 2 for example of sample tag; labels are completed with the equivalent information):
 - Record the project code (i.e., project or task number).
 - Enter the station number (sample number) if applicable.
 - Record the date to indicate the month, day, and year of sample collection.
 - Enter the time (military) of sample collection.
 - Place a check to indicate composite or grab sample.
 - Record the station (sample) location.
 - Sign in the space provided.
 - Place a check next to "yes" or "no" to indicate if a preservative was added.
 - Place a check under "Analyses" next to the parameters for which the sample is to be analyzed. If the desired analysis is not listed, write it in the empty slot. Note: Do not write in the box for "laboratory sample number."
 - Place or write additional relevant information under "Remarks".
2. Place adhesive labels directly on the sample containers. Place clear tape over the label to protect from moisture.
3. Securely attach sample tags to the sample bottle. On 80 oz. amber bottles, the tag string may be looped through the ring style handle and tied. On all other containers, it is recommended that the string be looped around the neck of the bottle, then twisted and re-looped around the neck until the slack in the string is removed.

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Figure 2
EXAMPLE Sample Tag

		Preservative: Yes <input type="checkbox"/> No <input type="checkbox"/>	
		ANALYSES	
Designator Grab Comp.	Time	Station No.	BOD Ardens Solids (SS) (TSS) (VSS)
			COD, TOC, Nutrients
Month/Day/Year	Station Location	Sample Signature	Phenolics
			Mercury
Project Code	Station Location	Sample Signature	Metals
			Cyanide
Station No.	Station Location	Sample Signature	Oil and Grease
			Organics GC/MS
Station No.	Station Location	Sample Signature	Priority Pollutants
			Volatile Organics
Station No.	Station Location	Sample Signature	Pesticides
			Mutagenicity
Station No.	Station Location	Sample Signature	Bacteriology
			Remarks:
Tag No. Lab Sample No.		3-3023215	

NOTE: Equivalent sample labels or tags may be used.

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5.3 Custody Seals

Custody seals must be placed on the shipping containers (e.g., picnic cooler) prior to shipment. The seal should be signed and dated by a field team member.

Custody seals may also be placed on individual sample bottles. Check with the client or refer to EPA regional guidelines for direction.

5.4 Sample Shipping

The CDM Federal standard operating procedure listed below defines the requirements for packaging and shipping environmental samples.

- CDM Federal SOP 2-1, Packaging and Shipping of Environmental Samples

6.0 RESTRICTIONS/LIMITATIONS

Check with the EPA region or client for specific guidelines. If no specific guidelines are identified, this procedure should be followed.

For EPA Contract Laboratory Program (CLP) sampling events, combined chain-of-custody/traffic report forms or other EPA-specific records may be used. Refer to regional guidelines for completing these forms.

The EPA FORMS II Lite™ software may be used to customize sample labels and custody records when directed by the client or the CDM Federal project manager.

SAMPLE CUSTODY

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7.0 REFERENCES

U.S. Environmental Protection Agency, *EPA Guidance for Quality Assurance Project Plans*, EPA QA/G-5, EPA/600/R-98/018, February 1998, Section B3.

U.S. Environmental Protection Agency, *National Enforcement Investigations Center, Multi-Media Investigation Manual*, EPA-330/9-89-003-R, Revised March 1992, p.85.

U.S. Environmental Protection Agency, *Contract Laboratory Program (CLP), Guidance for Field Samplers*, EPA-540-R-00-003, Draft Final, June 2001, Section 3.2.

U.S. Environmental Protection Agency, *FORMS II Lite™ User's Guide*, March 2001

U.S. Environmental Protection Agency, Region IV, *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual*, May 1996, Section 3.3.

U.S. Army Corps of Engineers, *Requirements for the Preparation of Sampling and Analysis Plan*, EM 200-1-3, February 2001, Appendix F.

Appendix F

CDM SOP 4-1 Field Logbook Content and Control

FIELD LOGBOOK CONTENT AND CONTROL

SOP 4-1

Revision: 4

Date: June 20, 2001

Page 1 of 5

Prepared: Del Baird

Technical Review: Larry Davidson

QA Review: David O. Johnson

Approved: [Signature]

Signature/Date

Issued: [Signature]

Signature/Date

1.0 OBJECTIVE

The objective of this standard operating procedure (SOP) is to set CDM Federal criteria for content entry and form of field logbooks. Field logbooks are an essential tool to document field activities for historical and legal purposes.

2.0 BACKGROUND

2.1 Definitions

Biota - The flora and fauna of a region.

Magnetic Declination Corrections - Compass adjustments to correct for the angle between magnetic north and geographical meridians.

2.2 Discussion

Information recorded in field logbooks includes field team names, observations, data, calculations, date/time, weather, and description of the data collection activity, methods, instruments, and results. Additionally, the logbook may contain deviations from plans and descriptions of wastes, biota, geologic material, and site features including sketches, maps, or drawings as appropriate.

3.0 RESPONSIBILITIES

Field Team Leader (FTL) - The FTL is responsible for ensuring that the format and content of data entries are in accordance with this procedure.

Site Personnel - All CDM Federal employees who make entries in field logbooks during onsite activities are required to read this procedure prior to engaging in this activity. The FTL will assign field logbooks to site personnel who will be responsible for their care and maintenance. Site personnel will return field logbooks to the records file at the end of the assignment.

FIELD LOGBOOK CONTENT AND CONTROL

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4.0 REQUIRED EQUIPMENT

- Site-specific plans
- Field notebook
- Indelible black or blue ink pen
- Ruler or similar scale

5.0 PROCEDURES

5.1 Preparation

In addition to this SOP, site personnel responsible for maintaining logbooks must be familiar with all procedures applicable to the field activity being performed. These procedures should be consulted as necessary to obtain specific information about equipment and supplies, health and safety, sample collection, packaging, decontamination, and documentation. These procedures should be located at the field office.

Field logbooks shall be bound with lined, consecutively numbered pages. All pages must be numbered prior to initial use of the logbook. Prior to use in the field, each logbook will be marked with a specific document control number issued by the document control administrator, if required by the contract quality implementation plan (QIP). Not all contracts require document control numbers. The following information shall be recorded on the cover of the logbook:

- Field logbook document control number.
- Activity (if the logbook is to be activity-specific) and location.
- Name of CDM Federal contact and phone number(s).
- Start date.
- In specific cases, special logbooks may be required (e.g., waterproof paper for storm water monitoring).

The first few (approximately five) pages of the logbook will be reserved for a table of contents (TOC). Mark the first page with the heading and enter the following:

TABLE OF CONTENTS

Date/Description

Page

(Start Date)/Reserved for TOC

1-5

The remaining pages of the table of contents will be designated as such with "TOC" written on the top center of each page.

FIELD LOGBOOK CONTENT AND CONTROL

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5.2 Operation

The following is a list of requirements that must be followed when using a logbook:

- Record work, observations, quantities of materials, calculations, drawings, and related information directly in the logbook. If data collection forms are specified by an activity-specific plan, this information need not be duplicated in the logbook. However, any forms used to record site information must be referenced in the logbook.
- Do not start a new page until the previous one is full or has been marked with a single diagonal line so that additional entries cannot be made. Use both sides of each page.
- Do not erase or blot out any entry at any time. Indicate any deletion by a single line through the material to be deleted. Initial and date each deletion. Take care to not obliterate what was written previously.
- Do not remove any pages from the book.

Specific requirements for field logbook entries include:

- Initial and date each page.
- Sign and date the final page of entries for each day.
- Initial and date all changes.
- Multiple authors must sign out the logbook by inserting the following:

Above notes authored by:

- (Sign name)
- (Print name)
- (Date)

- A new author must sign and print his/her name before additional entries are made.
- Draw a diagonal line through the remainder of the final page at the end of the day.
- Record the following information on a daily basis:
 - Date and time
 - Name of individual making entry
 - Names of field team and other persons on site
 - Description of activity being conducted including station or location (i.e., well, boring, sampling location number) if appropriate
 - Weather conditions (i.e., temperature, cloud cover, precipitation, wind direction, and speed) and other pertinent data
 - Level of personal protection to be used
 - Serial numbers of instruments
 - Required calibration information
 - Serial/tracking numbers on documentation (e.g., carrier air bills)

FIELD LOGBOOK CONTENT AND CONTROL

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Entries into the field logbook shall be preceded with the time (written in military units) of the observation. The time should be recorded frequently and at the point of events or measurements that are critical to the activity being logged. All measurements made and samples collected must be recorded unless they are documented by automatic methods (e.g., data logger) or on a separate form required by an operating procedure. In these cases, the logbook must reference the automatic data record or form.

At each station where a sample is collected or an observation or measurement made, a detailed description of the location of the station is required. Use a compass (include a reference to magnetic declination corrections), scale, or nearby survey markers, as appropriate. A sketch of station location may be warranted. All maps or sketches made in the logbook should have descriptions of the features shown and a direction indicator. It is preferred that maps and sketches be oriented so that north is toward the top of the page. Maps, sketches, figures, or data that will not fit on a logbook page should be referenced and attached to the logbook to prevent separation.

Other events and observations that should be recorded include:

- Changes in weather that impact field activities.
- Deviations from procedures outlined in any governing documents. Also record the reason for any noted deviation.
- Problems, downtime, or delays.
- Upgrade or downgrade of personal protection equipment.

5.3 Post-Operation

To guard against loss of data due to damage or disappearance of logbooks, completed pages shall be periodically photocopied (weekly, at a minimum) and forwarded to the field or project office. Other field records shall be photocopied and submitted regularly and as promptly as possible to the office. When possible, electronic media such as disks and tapes should be copied and forwarded to the project office.

At the conclusion of each activity or phase of site work, the individual responsible for the logbook will ensure that all entries have been appropriately signed and dated, and that corrections were made properly (single lines drawn through incorrect information, then initialed and dated). The completed logbook shall be submitted to the records file.

FIELD LOGBOOK CONTENT AND CONTROL

SOP 4-1

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6.0 RESTRICTIONS/LIMITATIONS

Field logbooks constitute the official record of onsite technical work, investigations, and data collection activities. Their use, control, and ownership are restricted to activities pertaining to specific field operations carried out by CDM Federal personnel and their subcontractors. They are documents that may be used in court to indicate dates, personnel, procedures, and techniques employed during site activities. Entries made in these notebooks should be factual, clear, precise, and non-subjective. Field logbooks, and entries within, are not to be utilized for personal use.

7.0 REFERENCES

Sandia National Laboratories, *Procedure for Preparing, Sampling and Analysis Plan, Site-Specific Sampling Plan, and Field Operating Procedures*, QA-02-03, Albuquerque Environmental Program Department 3220, Albuquerque, New Mexico, 1991.

Sandia National Laboratories, Division 7723, *Field Operation Procedure for Field Logbook Content and Control*, Environmental Restoration Department, Albuquerque, New Mexico, 1992.

Appendix G

Field Sample Data Sheet

CONTAMINANT SCREENING STUDY**FIELD SAMPLE DATA SHEET FOR SOIL – LAB QC SAMPLES**Scenario No.: N/A Field Logbook No: N/A Page No: N/A Sampling Date: _____

Address: 2714 Walnut Street

Owner: CDM Prep Lab

Business Name: CDM

Land Use: N/ASampling Team: CDM Names (circle): Todd Burgesser, Kristin Sloane, Dee Warren

Data Item	Sample 1	Sample 2	Sample 3
Index ID			
Location ID	AD-000678	AD-000678	AD-000678
Sample Group	CDM Prep Lab	CDM Prep Lab	CDM Prep Lab
Location Description (circle)	N/A	N/A	N/A
Category (circle)	Prep Duplicate of _____ Prep Blank (Type: _____) Other _____	Prep Duplicate of _____ Prep Blank (Type: _____) Other _____	Prep Duplicate of _____ Prep Blank (Type: _____) Other _____
Matrix Type (Surface soil unless otherwise noted)	Soil Sand Other _____	Soil Sand Other _____	Soil Sand Other _____
Type (circle)	Grab Comp. # subsamples _____ N/A	Grab Comp. # subsamples _____ N/A	Grab Comp. # subsamples _____ N/A
Sample Time	N/A	N/A	N/A
Top Depth (in.)	N/A	N/A	N/A
Bottom Depth (in.)	N/A	N/A	N/A
Grid, Quadrant, Section	N/A	N/A	N/A
Field Comments			
(for data entry use only)	Entered ____ Validated ____	Entered ____ Validated ____	Entered ____ Validated ____

Field Team	Initial
Completed by	
QC by	

Appendix H

CSF Chain-of-Custody Form

From: CDM

2714 Walnut St

Denver, CO 80205

U.S. Environmental Protection Agency, Region VIII

999 18th Street, Suite 300

Denver, CO 80202-2413

Send to: Hygeia

82 W Sierra Madre Blvd

Sierra Madre, CA 91024-2434

via: ☐ hand delivery ☒ shipped

Date Shipped: 4/24/2003

Carrier Name: Fed-Ex

Airbill: 9999999999

Sample Placed in Cooler/Bag	Index ID	Suffix ID*	Suffix #	Sample Date	Sample Matrix (S=Soil; W=Water; D=Dust; A=Air; B=Bulk Insulation)	Turn Around Time	Analysis Request	Comments	Sample Received by Lab
<input type="checkbox"/>	CS-08859	FG	1	10/4/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-08860	FG	1	10/4/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-09253	FG	1	10/10/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-09256	FG	1	10/10/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-09353	FG	1	10/10/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-09398	FG	1	10/11/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-09946	FG	1	10/22/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-09950	FG	1	10/22/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-10412	FG	1	11/1/2002	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>
<input type="checkbox"/>	CS-11124	FG	1	3/4/2003	S		PLM VE SRC-Libby-03-Rev0		<input type="checkbox"/>

*Suffix IDs: C= Coarse; B= Bulk; F= Fine; FG= Fine Ground; CA= Archive Coarse; BA= Archive Bulk; FA= Archive Fine; FGA=Archive Fine Ground

Total Number of Samples 10

END OF SUBMITTAL

Additional Comments:

Relinquished by (Signature and Company)

Date/Time

Received by (Signature and Company)

Date/Time

Sample Condition upon Receipt

Relinquished by (Signature and Company)

Date/Time

Received by (Signature and Company)

Date/Time

Sample Condition upon Receipt

Relinquished by (Signature and Company)

Date/Time

Received by (Signature and Company)

Date/Time

Sample Condition upon Receipt

Apr 24, 2003 Rev 1

Laboratory Copy

Page 1 of 1

Appendix I

Request for Modification Form



Request for Modification To Soil Sample Preparation Activities

Instructions to Requester: E-mail form to contacts at bottom of form for review and approval.

File approved copy at the Close Support Facility (CSF). CSF personnel distributes approved forms as follows: EPA, Volpe, Laboratory Coordinator (CDM)

Method (circle one/those applicable): ISSI-LIBBY-01 (Rev. 5), Other: _____

Requester: _____ Title: _____

Company: _____ Date: _____

Effective Date: _____

Description of Modification:

Reason for Modification:

Potential Implications of this Modification:

Duration of Modification (circle one):

Temporary Date(s): _____

Preparation Batch ID: _____

Temporary Modification Forms –

- If appropriate, attach a list of all applicable index/suffix identification numbers.
- Maintain legible copies of approved form in a binder that can be accessed by CSF personnel

Permanent (complete Proposed Modification Section)

Permanent Modification Forms –

- Permanent Mod applies to (circle one):

C B F FG AC AB AF AFG N/A

- Maintain legible copies of approved form in a binder that can be accessed by CSF personnel.

Proposed Modification to Method (attach additional sheets if necessary; state section and page numbers of Method when applicable):

Technical Review: _____ Date: _____

(CDM Close Support Facility Manager or designate)

Approved By: _____ Title: _____ Date: _____

(USEPA: Project Chemist or designate)

CC: (USDOT Volpe Center: Mark Raney)

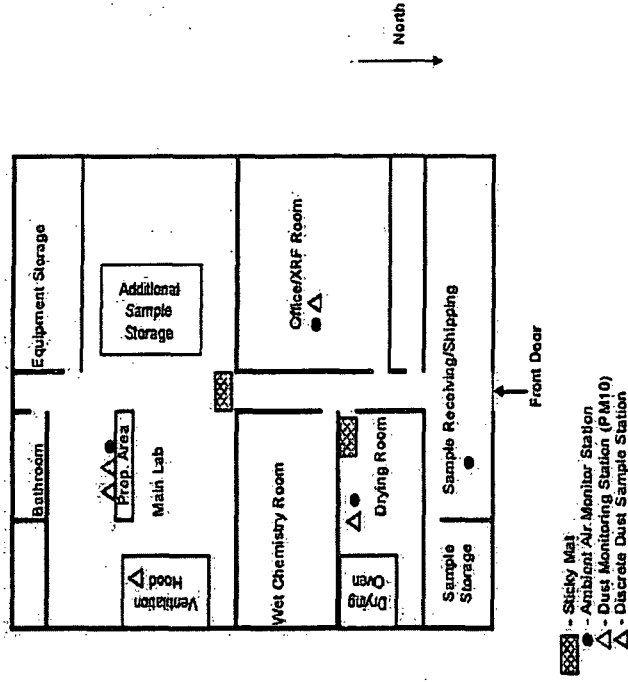
Appendix J

Health and Safety Plan

Health and Safety Plan Form		Environmental Protection Agency -- Region 8 --		CDM Federal Programs Corporation	
Project Document No.:					
Project Name	Libby Asbestos Project	Work Assignment No.	Task Orders 9, 13, 16, 18, 19, and 20	Region 8	
Job Site Address	CDM Close Support Facility	Client	U. S. Environmental Protection Agency		
	2714 Walnut Street, Denver, Colorado 80205	Project	Libby, Montana - Remedial Investigation		
Site Contact	Jeff Montera/Todd Burgess	EPA Client Contact	Jim Christiansen, EPA RPM		
Phone No.	303-295-1237 or 303-298-1311, 303-229-3204	Phone No.	303-312-6748		
<input type="checkbox"/> Amendment No. _____ to Existing Approved HSP - Date Existing Approved HSP _____					
Objectives of Field Work:		Type: Check as many as applicable			
The purpose of this work is to prepare and process soil samples collected in Libby. After completing this preparation process, these samples will be sent for analysis upon request.		<input checked="" type="checkbox"/> Active <input type="checkbox"/> Landfill <input type="checkbox"/> Unknown <input type="checkbox"/> Inactive <input type="checkbox"/> Uncontrolled <input type="checkbox"/> Military <input checked="" type="checkbox"/> Secure <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Other specify: <input type="checkbox"/> Unsecure <input type="checkbox"/> Recovery Soil preparation laboratory <input type="checkbox"/> Enclosed space <input type="checkbox"/> Well Field			
Description and Features: Summarize below. Include principal operations and unusual features (containers, buildings, dikes, power lines, hills, slopes, river) The Town of Libby is located in the northwest corner of Montana. According to historical mining records, 80 percent of the world's vermiculite came from the Zonolite Mountains near Libby, Montana. Vermiculite is used in various building materials and textiles. The scope of this health and safety plan will address the processes of soil sample preparation. The project work will be conducted in the CDM close support facility in Denver, Colorado. Soils to be processed were collected in and around the Town of Libby, Montana, during the contaminant screening study. These operations will involve sample receiving, drying, sieving, grinding, splitting, and shipping.					
Surrounding Population: <input checked="" type="checkbox"/> Residential <input type="checkbox"/> Industrial <input type="checkbox"/> Rural <input type="checkbox"/> Urban <input type="checkbox"/> Other:					

This Page Reserved for Map (Show Exclusion, Contamination Reduction, and Support Zones. Indicate evacuation and reassembly points.)

Site Location Map - Floor plan of laboratory



Health and Safety Plan Form

Environmental Protection Agency
-- Region 8 --

CDM Federal Programs Corporation

History: Summarize below. In addition to history, include complaints from public, previous agency actions, known exposures or injuries, etc.

Asbestos was released into the air during more than 6 decades of vermiculite mining at Zonolite Mountain, 3 miles east of Libby, Montana. The Zonolite Mine began operation in 1924 by owner Edward Alley. In 1925, Great Northern Railroad shipped the first boxcar of "Zonolite" from Libby to an Ohio company that used it to insulate bank vaults, office safes, and filing cabinets. Other firms used the material to make building boards and roofing materials. The vermiculite ore was stripped from the mine and hauled in trucks to a mill, where it was separated into various commercial sizes through a screening system. Some of the ore was shipped untouched. Other material was sent to an expansion plant where it was processed in ovens at approximately 2,000 degrees, causing it to expand to 15 times its original size. In 1939, Zonolite merged with another company mining at the bottom of the hill that eventually became known as the Zonolite Co. In 1963, the company was sold to W.R. Grace and Co. who expanded the operation and increased production. Through the '60s, '70s, and '80s, millions of tons of vermiculite ore was hauled by rail to Grace plants and other companies in 30 states and 6 foreign countries. The W.R. Grace Company, which owned the mine for 30 years, closed it in 1990 and sold the property 4 years later.

Waste Types: ☐ Liquid ☒ Solid ☐ Sludge ☐ Gas ☐ Unknown ☐ Other Specify:

Waste Characteristics: Check as many as applicable.

- ☐ Corrosive ☐ Flammable ☐ Radioactive*
☒ Toxic ☐ Volatile ☐ Reactive
☐ Inert Gas ☐ Unknown ☒ Other specify: Carcinogenic

*Based on available information there is no evidence that this site has received or used radioactive substances. None are described in facility processes.

Work Zones: Describe the Exclusion, Contamination Reduction, and Support Zones in terms onsite personnel will recognize.

Work zones will be established during soil preparation activities. Unauthorized personnel will not be allowed in areas containing activities that potentially generate airborne fibers. All soil preparation activities will be completed under a properly maintained and monitored hood.

Hazards of Concern:

- ☐ Heat Stress attach guidelines ☒ Noise:
☐ Cold Stress attach guidelines ☐ Inorganic Chemicals
☐ Explosive/Flammable ☐ Organic Chemicals
☐ Oxygen Deficient ☐ Motorized Traffic
☐ Radiological ☐ Heavy Machinery:
☐ Biological: snakes, spiders ☒ Slips, Trips and Falls
☒ Other Specify: Inhalation of asbestos fiber

Principle Disposal Methods and Practices: Summarize below:

The investigation-derived wastes (i.e., HEPA filters, soil preparation waste, and PPE) will be double-bagged or contained and disposed of as municipal waste.

Health and Safety Plan Form

Environmental Protection Agency -- Region 8 --

CDM Federal Programs Corporation

Hazardous Material Summary: Circle waste type and estimate amounts by category

Chemicals Amounts/Units:	Solids Amounts/Units:	Sludges Amounts/Units:	Solvents Amounts/Units:	Oils Amounts/Units:	Other Amounts/Units:
<input type="checkbox"/> Acids <input type="checkbox"/> Pickling Liquors <input type="checkbox"/> Caustics <input type="checkbox"/> Pesticides <input type="checkbox"/> Dyes/Inks <input type="checkbox"/> Cyanides <input type="checkbox"/> Phenols <input type="checkbox"/> Halogens <input type="checkbox"/> Dioxins <input type="checkbox"/> Other Specify:	<input type="checkbox"/> Flyash <input checked="" type="checkbox"/> Asbestos <input type="checkbox"/> Milling/Mine Tailings <input type="checkbox"/> Ferrous Smelter <input type="checkbox"/> Non-ferrous Smelter <input type="checkbox"/> Metals: <input type="checkbox"/> Other Specify: Material that is >1% asbestos is classified as asbestos-containing material (ACM). Some soil samples may have asbestos concentrations that would classify them as ACM.	<input type="checkbox"/> Paint <input type="checkbox"/> Pigments <input type="checkbox"/> Metal Sludges <input type="checkbox"/> POTW Sludge <input type="checkbox"/> Aluminum <input type="checkbox"/> Distillation Bottoms <input type="checkbox"/> Other Specify:	<input type="checkbox"/> Halogenated (chloro, bromo) <input type="checkbox"/> Solvents <input type="checkbox"/> Hydrocarbons <input type="checkbox"/> Alcohols <input type="checkbox"/> Ketones <input type="checkbox"/> Esters <input type="checkbox"/> Ethers <input type="checkbox"/> Other Specify:	<input type="checkbox"/> Oily Wastes <input type="checkbox"/> Gasoline <input type="checkbox"/> Diesel Oil <input type="checkbox"/> Lubricants <input type="checkbox"/> PCBs <input type="checkbox"/> Polynuclear Aromatics <input type="checkbox"/> Other Specify:	<input type="checkbox"/> Laboratory <input type="checkbox"/> Pharmaceutical <input type="checkbox"/> Hospital <input type="checkbox"/> Radiological <input type="checkbox"/> Municipal <input type="checkbox"/> Construction <input type="checkbox"/> Munitions <input type="checkbox"/> Other Specify:

Overall Hazard Evaluation: ☐ High ☐ Medium ☒ Low ☐ Unknown (Where tasks have different hazards, evaluate each. Attach additional sheets if necessary)

Justification: Air sampling results from 2000, 2001, and 2002 activities have indicated low asbestos concentrations in exclusion zones. Soil sample processing will be conducted under engineered and controlled conditions. Care will be taken by all facility personnel to avoid unnecessarily agitating suspect materials. PPE prescriptions are adequate to address current potential hazards. Review of recently acquired data and information will be completed as obtained. Additionally, a baseline exposure assessment will be completed at the initiation of soil preparation activities.

Fire/Explosion Potential: ☐ High ☐ Medium ☒ Low ☐ Unknown

Background Review: ☒ Complete ☐ Incomplete

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Known Contaminants	Highest Observed Concentration (specify units and media)	PEL/TLV ppm or mg/m ³ (specify)	IDLH ppm or mg/m ³ (specify)	Excursion Limit (≤30 minutes)	Symptoms/Effects of Acute Exposure	Photoionization Potential
Asbestos****	5 to 7 percent in the waste piles	0.1 f/cc*/ 0.01 f/cc**	N/A	1.0 f/cc	Asbestosis (chronic exposure) dyspnea (breathing difficulty), interstitial fibrosis, restricted pulmonary function, irritated eyes (per NIOSH pocket guide)	N/A
Asbestos****	4.481 f/cc***	0.1 f/cc*/ 0.01 f/cc**	N/A	1.0 f/cc	Asbestosis (chronic exposure) dyspnea (breathing difficulty), interstitial fibrosis, restricted pulmonary function, irritated eyes (per NIOSH pocket guide)	N/A

ACGIH = American Conference of Government Industrial Hygienists

CA = Human carcinogen

CAS = Chemical Abstract Service

f/cc = fibers per cubic centimeter

IDLH = Immediately Dangerous to Life and Health (NIOSH standard enforced by law)

LEL = Lower Explosive Limit

mg/m³ = milligrams per cubic meter

NE = Not established

NIOSH = National Institute for Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

PEL = Permissible Exposure Limit (OSHA-established workplace standards enforced by law)

ppm = parts per million

STEL = Short Term Exposure Limit (15 minute TWA)

TLV = Threshold Limit Values (Recommended by ACGIH)

TWA = Time-Weighted Average (Average concentration for a normal 8-hour working day or 40-hour working week)

µg/kg = micrograms per kilogram

µg/ = micrograms per Liter

* = personal air monitoring by Phase Contrast Microscopy (PCM)

** = ambient/perimeter re-occupancy by PCM

*** = cutting hole in ceiling - 30 minute excursion

**** = Concentrations represent worst case scenarios completed in Libby, Montana, and are not indicative of potential levels of fiber in the laboratory. A baseline exposure assessment will be completed at the initiation of soil preparation activities.

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Activities Covered under this Plan					Hazard
Task Description/Specific Technique-Standard Operating Procedures/Site Location(attach additional sheets as necessary)	Type	Primary	Contingency	Schedule	
1 Receiving samples	Intrusive	Level D - Modified	Exit Area	Hazard Risk: LOW	
	Non-Intrusive		Level C - Modified	Date: 2003	
2 Drying samples	Intrusive	Level D - Modified	Level C - Modified or Exit Area	Hazard Risk: LOW	
	Non-Intrusive			Date: 2003	
3 Sieving samples	Intrusive	Level D - Modified	Exit Area	Hazard Risk: LOW	
	Non-Intrusive		Level C - Modified	Date: 2003	
4 Grinding samples	Intrusive	Level D - Modified	Level C - Modified or Exit Area	Hazard Risk: LOW	
	Non-Intrusive			Date: 2003	
5 Splitting samples	Intrusive	Level D - Modified	Level C - Modified or Exit Area	Hazard Risk: LOW	
	Non-Intrusive			Date: 2003	
6 Shipping/packaging samples	Intrusive	Level D - Modified	Exit Area	Hazard Risk: LOW	
	Non-Intrusive		Level C - Modified	Date: 2003	
7	Intrusive	Level D - Modified	Level C - Modified	Hazard Risk:	
	Non-Intrusive			Date:	
8	Intrusive	Level D - Modified	Exit Area	Hazard Risk:	
	Non-Intrusive			Date:	

Personnel and Responsibilities (Include subcontractors)

Name	Firm/Region	CDM Health Clearance	Responsibilities	Onsite Involvement
Jeff Montero	CDM	Yes	Task Manager	Tasks 1 - 6
Douglas J. Updike	CDM	Yes	Site Health and Safety Coordinator	Tasks 1 - 6
Todd Burgess	CDM	Yes	CSF Manager	Tasks 1 - 6
Chuck Myers	CDM	Yes	Health and Safety Manager	Tasks 1 - 6
Tim Wall	CDM	Yes	Project Manager	Tasks 1 - 6

Health and Safety Plan Form

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Protective Equipment: Specify by task. Indicate type and/or material as necessary. Use copies of this sheet if needed.

Block A	Task: 1 (Receiving Samples) Level: D - Modified	Primary <input type="checkbox"/> Contingency	
Respiratory: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Safety Glasses: <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber:	Prot. Clothing: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input type="checkbox"/> Tyvek Coverall: if needed <input type="checkbox"/> Cloth Coverall: Cotton as needed <input type="checkbox"/> Other: Long pants & long-sleeved shirt Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical/latex. <input type="checkbox"/> Overgloves: Other - specify below: Care should be taken to observe and note any open or broken sample containers.	Block B Task: 1 (Receiving Samples) Level: C - Modified or Exit Area <input type="checkbox"/> Primary <input checked="" type="checkbox"/> Contingency Respiratory: <input type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: if 1/2-faced respirator used <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber:	Prot. Clothing: <input type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input checked="" type="checkbox"/> Tyvek Coverall: <input type="checkbox"/> Cloth Coverall: <input type="checkbox"/> Other: Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical/latex <input type="checkbox"/> Overgloves: Other - specify below: Exit Area
Block C Task: 2 (Drying Samples) Level: D - Modified <input type="checkbox"/> Primary <input checked="" type="checkbox"/> Contingency Respiratory: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber:	Prot. Clothing: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input type="checkbox"/> Tyvek Coverall: <input type="checkbox"/> Cloth Coverall: <input type="checkbox"/> Other: Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical latex <input type="checkbox"/> Overgloves: Other - specify below: Drying of soil samples will occur in a HEPA vented oven. See Attachment 1 for details.	Block D Task: 2 (Drying Samples) Level: C - Modified or Exit Area <input type="checkbox"/> Primary <input checked="" type="checkbox"/> Contingency Respiratory: <input type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: if 1/2-faced respirator used <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber:	Prot. Clothing: <input type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input checked="" type="checkbox"/> Tyvek Coverall: <input type="checkbox"/> Cloth Coverall: <input type="checkbox"/> Other: Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical/latex <input type="checkbox"/> Overgloves: Other - specify below: Exit Area

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Environmental Protection Agency

CDM Federal Programs Corporation

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Protective Equipment: Specify by task. Indicate type and/or material as necessary. Use copies of this sheet if needed.

Block A	Task: 3 (Sieving Samples) Level: D - Modified	Primary <input type="checkbox"/> Contingency
Respiratory: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber: Prot. Clothing: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input type="checkbox"/> Tyvek Coverall: if needed <input type="checkbox"/> Cloth Coverall: Cotton as needed <input type="checkbox"/> Other: Long pants & long-sleeved shirt Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical/latex. <input type="checkbox"/> Overgloves: Other - specify below: All soil sieving will be completed under a negative flow HEPA Hood. See Attachment 1 for details.	Respiratory: <input type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input checked="" type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: if 1/2-faced respirator used <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber: Prot. Clothing: <input type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input checked="" type="checkbox"/> Tyvek Coverall: <input type="checkbox"/> Cloth Coverall: <input type="checkbox"/> Other: Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical/latex <input type="checkbox"/> Overgloves: Other - specify below: All soil grinding will occur under a negative flow HEPA Hood. See Attachment 1 for details.	Task: 3 (Sieving Samples) Level: C - Modified or Exit Area <input type="checkbox"/> Primary <input checked="" type="checkbox"/> Contingency
Respiratory: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: if 1/2-faced respirator used <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber: Prot. Clothing: <input type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input checked="" type="checkbox"/> Tyvek Coverall: <input type="checkbox"/> Cloth Coverall: <input type="checkbox"/> Other: Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical/latex <input type="checkbox"/> Overgloves: Other - specify below: Exit Area	Respiratory: <input type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input checked="" type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: if 1/2-faced respirator used <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber: Prot. Clothing: <input type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input checked="" type="checkbox"/> Tyvek Coverall: <input type="checkbox"/> Cloth Coverall: <input type="checkbox"/> Other: Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical/latex <input type="checkbox"/> Overgloves: Other - specify below: Exit Area	Task: 4 (Grinding Samples) Level: C - Modified or Exit Area <input type="checkbox"/> Primary <input checked="" type="checkbox"/> Contingency

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Protective Equipment: Specify by task. Indicate type and/or material as necessary. Use copies of this sheet if needed.

Block A	Task: 5 (Splitting Samples) Level: D - Modified	Primary <input type="checkbox"/> Contingency	Block B	Task: 5 (Splitting Samples) Level: C - Modified or Exit Area	Primary <input type="checkbox"/> Contingency
Respiratory: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Orange traffic vest Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber: Other - specify below: All soil splitting will be completed under a negative flow HEPA Hood. See Attachment 1 for details.	Prot. Clothing: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron <input type="checkbox"/> Tyvek Coverall: if needed <input type="checkbox"/> Cloth Coverall: Cotton as needed <input type="checkbox"/> Other: Long pants & long-sleeved shirt Gloves: <input type="checkbox"/> Not Needed <input type="checkbox"/> Undergloves: <input checked="" type="checkbox"/> Gloves: Nitrile or surgical/latex. <input type="checkbox"/> Overgloves: Other - specify below: All soil splitting will be completed under a negative flow HEPA Hood. See Attachment 1 for details.	Respiratory: <input type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input checked="" type="checkbox"/> APR: <input type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: if 1/2-faced respirator used <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber: Other - specify below: Exit Area			
Block C Tasks: 6 (Shipping/Pkg) Level: D - Modified Primary <input type="checkbox"/> Contingency	Respiratory: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: P100 <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber: Other - specify below: Exit Area	Block D Tasks: 6 (Shipping/Pkg) Level: C - Modified or Exit Area Primary <input type="checkbox"/> Contingency	Respiratory: <input type="checkbox"/> Not Needed <input type="checkbox"/> SCBA, Airline: <input checked="" type="checkbox"/> APR: <input type="checkbox"/> Cartridge: <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other: Head and Eye: <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses: if 1/2-faced respirator used <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <input type="checkbox"/> Other: Boots: <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <input type="checkbox"/> Overboots: <input type="checkbox"/> Rubber: Other - specify below: Exit Area		

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Monitoring Equipment: Specify by task. Indicate type as necessary. Attach additional sheets as necessary.

Instrument	Task	Action Guidelines	Comments (Include schedules of use)
Air Sampling -Low volume sample pump -High volume sample pump -25mm mixed cellulose ester (MCE) filter cassettes -Inert tubing -Extension cords -Rotometer	1 - 6	NA	<input type="checkbox"/> Not Needed Equipment will be used during the negative exposure assessment and periodic monitoring (see Attachment 1)
Dust Sampling -Low volume sample pump -25mm MCE filter cassettes -Inert tubing -Rotometer	1 - 6	NA	<input type="checkbox"/> Not Needed Equipment will be used during the negative exposure assessment and periodic monitoring (see Attachment 1)
Photoionization Detector Type <input type="checkbox"/> 11.7 eV <input type="checkbox"/> 10.2 eV <input type="checkbox"/> 9.8 eV <input type="checkbox"/> eV	1 - 6	Specify: Detectable Odor If odor of any kind is detected, cease work, move to fresh air.	<input checked="" type="checkbox"/> Not Needed If further work is necessary in the area where odors are detected, personnel protection will be evaluated.
Flame Ionization Detector Type _____	1 - 6	Specify:	<input checked="" type="checkbox"/> Not Needed If further work is necessary in the area where odors are detected, personnel protection will be evaluated.
Respirable Dust Monitor Type <u>Real-time Area Dust Monitor</u>	1 - 6	Specify: A Mini-Ram will be used during sample processing activities to monitor particulate concentrations. An audible alarm will be set at 3 mg/m ³ (respirable particles) and 10 mg/m ³ (total particles).	<input type="checkbox"/> Not Needed If visibly dusty conditions persist, work will stop and work processes will be re-evaluated and modified.
Respirable Dust Monitor Type <u>Fibrous Aerosol Monitor</u> Type _____	1 - 6	Specify: Fibrous aerosol monitor will be used as a contingency monitoring method based on the negative exposure assessment evaluation during sample processing activities. If the contingency is implemented, an audible alarm will sound if fiber concentrations exceed 1 f/cc (30-minute short-term exposure limit) or 0.1 f/cc (time-weighted average)	<input type="checkbox"/> Not Needed If visibly dusty conditions or audible alarms on the fibrous aerosol monitor persist, work will stop and personnel protection re-evaluated.
Other Specify: Anemometer	1 - 6	Specify: An anemometer will be used to monitor flow velocities of the negative flow HEPA Hood.	

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Decontamination Procedures

Personalized Decontamination

Wash well before hand to mouth contact is made. Workers will remove protective clothing in this order:

- (1) remove gloves
- (2) remove safety glasses
- (3) remove Tyvek coverall, if used
- (4) remove respirator, if used
- (5) remove inner gloves
- (6) wash hands/face before eating/drinking

☐ Not Needed

Containment and Disposal Method

All disposable PPE will be double-bagged prior to disposal. Water used for personal cleaning will be disposed of down the drain of the sink used to wash.

☐ Not Needed

Sampling Equipment Decontamination

All preparation equipment will be thoroughly decontaminated in accordance with the soil preparation plan (SPP).

☐ Not Needed

Containment and Disposal Method

IDW will be disposed of in accordance with the SPP.

☐ Not Needed

Heavy Equipment Decontamination

☒ Not Needed

Containment and Disposal Method

All disposable PPE will be double-bagged prior to disposal.

☒ Not Needed

Hazardous Materials Inventory (Investigation-Associated Substances: Attach MSDS)

Preservatives

- ☐ Hydrochloric Acid (HCl) ☐ Ascorbic Acid
- ☐ Nitric Acid (HNO₃) ☐ Other:
- ☐ Sulfuric Acid (H₂SO₄) ☐ Other:
- ☐ Sodium Hydroxide (NaOH)
- ☐ Zinc Acetate (ZnOAc)

Decontamination

- ☐ Alconox®
- ☐ Liquinox®
- ☐ Acetone
- ☐ Methanol
- ☐ Mineral Spirits
- ☐ Hexane
- ☐ Isopropanol
- ☐ Nitric Acid
- ☒ Other: Water

Calibration Gases and Fluids

- ☐ Isobutylene
- ☐ Methane
- ☐ Pentane
- ☐ Hydrogen
- ☐ Propane
- ☐ pH Standard
- ☐ Conductivity Standard
- ☐ Other
- ☐ Other

*If standard field clothes are used, the clothing must be kept separate from all personal articles and washed before it is reused. Under no circumstance can soiled clothing be donned at the beginning of each work day. Any article of clothing that becomes unusually soiled during laboratory activities must be replaced with a clean item.

Health and Safety Plan Form		Environmental Protection Agency -- Region 8 --		CDM Federal Programs Corporation		
Emergency Contacts		Emergency Contacts		Name		
Water Supply	NA	Health and Safety Manager	Chuck Myers, CIH	1-703-968-0900		
Site Telephone	1-303-308-2310	Task Manager CSF Manager	Jeff Montero Todd Burgess	1-303-295-1237 1-303-298-1311 or 303-229-3204		
EPA Release Report No.	1-800-424-8802	Health & Safety Coordinator	Douglas J. Updike	1-816-412-3149		
CDM 24-Hour Emergency Chuck Myers	(cell) 1-571-216-7004	DOT Contact	John McGuiggin	1-617-494-2574		
Facility Management	NA	EPA Contact	Jim Christianson	1-303-312-6807		
Other (Specify) Health & Safety Mgr.	Chuck Myers (home) 1-703-754-0700	Environmental Agency		1-800-234-5677		
CHEMTREC Emergency	1-800-424-9300	Health Department		1-406-293-7881		
Contingency Plans Summarize below: Evacuate laboratory if any unexpected hazardous conditions are encountered. If staff observe hazards for which they have not been prepared, they will withdraw from the area and call CDM Health and Safety. See Attachment 1 for action levels and corrective actions.		Sheriff's Department		911		
		State Spill Line		911		
		Fire Department		911		
		Police Department - Libby		911		
		State Police	Highway Patrol	1-303-239-4500		
		Poison Control Center		1-800-525-5042		
		Occupational Physician	Dr. Edward Barnes	1-800-229-3674		
		Medical Emergency				
		Hospital Name: Denver Health Medical Center		911		
		Hospital Address: 777 Bannock Street				
Name of Contact at Hospital: NA						
Name of 24-Hour Ambulance:		911				
Route to Hospital (Attach map with route to hospital)						
From the front of the CSF travel northeast on Walnut. Travel 0.1 miles to 28 th Street. Turn southeast (right) on 28 th Street. Travel 0.1 miles to Larimer Street. Turn southwest (right) on Larimer Street. Travel 1.3 miles to Speer Blvd. Turn southeast (left) onto Speer Blvd. Travel 1.4 miles to Bannock Street. Turn south (right) onto Bannock Street. Become familiar with location of hospital prior to any activities.						
Prepared by: Doug Updike		Date: 3-13-2003				
SHSO Signature:		Date:				
HSM Signature:		Date:				
For: Chuck Myers, CIH						
Site: CDM Close Support Facility, 2714 Walnut Street, Denver, Colorado 80205		Distance to Hospital: 2.9 miles		Page 12 of 14		

This Page Reserved for Hospital Route Map

Health and Safety Plan Form**Environmental Protection Agency**
-- Region 8 --**CDM Federal Programs Corporation**

The following personnel have read and fully understand the contents of this Health and Safety Plan and further agree to all requirements contained herein.

Site: Libby, Montana - Asbestos Removal**Project No.:****Name and Responsibility****Affiliation****Date****Signature**

Jeff Montera - Task Manager

CDM

Douglas Uplike - Health and Safety Coordinator

CDM

Todd Burgess - CSF Manager

CDM

Tim Wall - Project Manager

CDM

Attachment 1

Laboratory Activities

Sample Drying

The oven used for drying the sample materials will be HEPA vacuumed and wet wiped after each drying batch. Additionally, the drying oven is vented through a HEPA filter.

Negative Flow HEPA Hood -

- 1) The negative flow HEPA hood will be wet wiped and HEPA vacuumed after the completion of each sample preparation batch or daily, whichever is more frequent.
- 2) The velocity of the negative flow HEPA hood will be checked with a flow meter/anemometer at the beginning of each sample day. The minimum allowable velocity in the negative flow HEPA hood will be 100 cubic feet per minute. A line will be drawn on the hood sash frame indicating the sash location where the minimum velocity is observed. The sash will not be opened further than this point.
- 3) During grinding operations, the sash will be lowered to increase the flow velocity.
- 4) HEPA filters in the hood will be changed when the indicator light becomes lit or at the manufacturer's recommended frequency, whichever is more frequent.

Laboratory Housekeeping

- 1) "Sticky mats" will be placed in the doorways of the drying room and the main laboratory to reduce the potential to track materials out of the laboratory.
- 2) Areas of sample handling and preparation will be HEPA vacuumed on a daily basis.
- 3) Areas of sample handling and preparation will be wet wiped on a daily basis.

Negative Exposure Assessment

Initially, a task-based negative exposure assessment will be completed to determine potential exposures. The negative exposure assessment will consist of ambient air samples, personal air samples, real-time fibrous aerosol monitoring, and microvacuum dust samples.

Ambient Air Samples

Ambient air samples will be collected in close proximity to the following areas:

- 1) Sample receiving/shipping
- 2) Soil drying room
- 3) Sample preparation area in the main laboratory
- 4) Office/XRF room

All ambient air samples will be collected using high volume sample pumps. Sample volumes for each ambient air sample collected will be a minimum of 1,199 liters of air with a target volume of 4,000 liters of air. EPA SOP 2015 *Asbestos Sampling* will be used as guidance for the ambient air sampling.

Personal Air Samples

Personal air samples will be collected by task. Two tasks have been assigned to this negative exposure assessment: 1) Sample receiving/laboratory coordination and 2) sample preparation using the negative flow HEPA hood. Each task will be sampled for 3 consecutive days and consist of time-weighted average samples and 30-minute excursion samples on each day. Sample volumes for each personal sample will meet the minimum criteria required by the Occupational Safety and Health Administration (OSHA) (25 liters for time-weighted average samples and 48 liters for 30-minute excursion samples). Personal sample flow rates will be between 0.5 liters per minute and 5.0 liters per minute. All personal air samples will be collected using battery powered personal sampling pumps. During the initial negative exposure assessment monitoring, close support facility personnel will be in Modified Level-C.

Air Sample Analysis

All air samples collected will be analyzed by two methods: NIOSH 7400 - *Asbestos and Other Fibers by PCM* and Appendix A to Subpart E of Part 763 - Interim Transmission Electron Microscopy (TEM) Analytical Method (also known as the AHERA method).

Microvacuum Dust Sampling

Microvacuum dust sampling will be completed during the initial negative exposure assessment. Microvacuum sampling will also continue on at the established air monitoring frequency. Microvacuum dust samples will be collected from the following locations:

- 1) Inside the ventilation hood
- 2) Soil drying room
- 3) Sample preparation area in the main laboratory
- 4) Office/XRF room

All microvacuum dust samples will be collected according to the ASTM Standard D 5755-95 "Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations."

Sampling Frequency

After completing the negative exposure assessment, ambient, personal, and microvacuum samples will be collected monthly for six months. Sampling frequency will become quarterly if results remain below evaluation criteria for six months. Evaluation of the results will determine additional sampling requirements. If results exceed the evaluation criteria (see below), corrective actions will be immediately taken and samples re-collected. If the second set of samples exceeds the evaluation criteria,

sample preparation will be stopped and a review of engineering controls and work practices will be held with CDM, EPA and Volpe.

Evaluation Criteria

- 1) **Ambient Sample Results** - If all ambient air sample PCM results are below 0.01 fibers per cubic centimeter (f/cc) and all transmission electron microscopy (TEM) results are less than or equal to one Libby amphibole structure identified, no corrective action will be taken. If one of these criteria is not met, the laboratory will be wet-wiped and HEPA vacuumed and ambient air samples recollected.
- 2) **Personal Sample Results** -
 - a) Personal sample PCM results will be compared to the OSHA permissible exposure limit (PEL) (0.1 f/cc) to determine future sampling requirements. If the PCM results are greater than 50 percent of the PEL, the laboratory will be wet-wiped and HEPA vacuumed and personal air samples recollected.
 - b) TEM analysis of the personal samples will be used to confirm that material detected in the PCM analysis is not Libby amphibole asbestiforms. The action level for the TEM analysis is 0.10 structures per cubic centimeter (S/cc) for structures ≥ 0.5 microns to < 5 microns and 0.01 S/cc for structures > 5 microns.
- 3) **Microvacuum Dust Sampling Results** - The action level criteria for dust sample results is 5,000 S/square centimeter (cm^2). If dust sample results indicate concentrations greater than 5,000 S/square centimeter (cm^2), the area represented by the sample will be wet wiped, HEPA vacuumed, and resampled.

Fibrous Aerosol Monitoring

Fibrous aerosol monitoring will be conducted as a contingency in the main laboratory preparation area. After data evaluation of the negative exposure assessment has been completed, a determination will be made as to whether to implement this contingency. If the contingency is implemented, fibrous aerosol monitoring will become a daily part of the soil sample preparation process. This type of monitoring provides real-time predictions (of short-term exposure concentrations and time-weighted averages) and concentrations. Audible alarms on the fibrous aerosol monitor will be set to inform CSF personnel of potentially approaching an action level. Action levels for the fibrous aerosol monitoring will be 1.0 f/cc for short-term exposure and 0.1 f/cc for a time-weighted average.

Real-Time Area Dust Monitoring

Real-time area dust monitoring will be conducted in the main laboratory preparation area. This type of monitoring will provide real time concentrations of particulates. An audible alarm on the monitor will be set to inform CSF personnel of potentially approaching an action level. Action levels for this particulate monitoring will be 3 mg/m^3 time-weighted average for respirable particulates and 10 mg/m^3 time-weighted average total particulates.